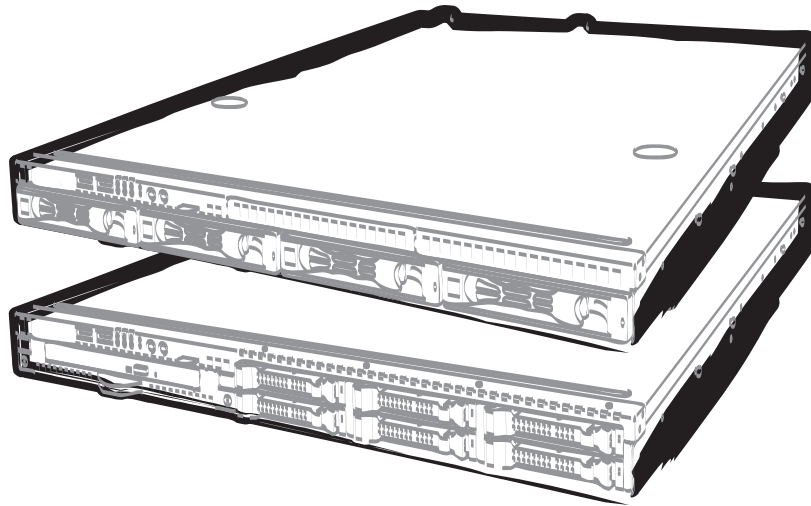




NEC Express Server
Express5800 Series

Express5800/R110f-1E EXP283A/EXP284A User's Guide

Model Number: N8100-1986F/1998F/1999F/2000F

Chapter 1 General Description

Chapter 2 Preparations

Chapter 3 Setup

Chapter 4 Appendix

Documents Provided with This Product

Documents for this product are provided as accompanying booklets () and as electronic manuals () stored within EXPRESSBUILDER DVD ()



Precautions for Use

Describes points of caution to ensure the safe use of this server.
Read these cautions before using this server.



Getting Started

Describes how to use this server, from unpacking to operations.
Refer to this guide as you begin for an overview of this server.



EXPRESSBUILDER



User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and ideal location for this server
Chapter 3: Setup	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information



Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and important information for installation
Chapter 2: Installing the Bundled Software	Installation of bundled software, such as NEC ESM PRO and Universal RAID Utility



Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Convenient Features	Useful features and the detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs



Other documents

Provides the detail of NEC ESM PRO, Universal RAID Utility, and the other features.

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Notations Used in This Document

Notations used in the text

In addition to safety-related symbols urging caution, three types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling the server or operating software. If the procedures described are not followed, <u>server failure, data loss, and other serious malfunctions could occur.</u>
Note	Indicates items that must be confirmed when handling the server or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drives

This server is equipped with one of the following drives, depending on the order at the time of purchase. These drives are referred to as *optical disk drives* in this document.

- DVD-ROM drive
- DVD Super MULTI drive

Hard disk drives

Unless otherwise stated, hard disk drives (HDD) described in this document refer to the following.

- Hard disk drives (HDD)
- Solid state drive (SSD)

Removable media

Unless otherwise stated, removable media described in this document refer to the following.

- USB memory
- Flash FDD

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

Refer to Chapter 1 (1.2 Supported Windows OS) in Installation Guide (Windows) for detailed information.

Notations in this document	Official names of Windows
Windows Server 2012	Windows Server 2012 Standard
	Windows Server 2012 Datacenter
	Windows Server 2012 Foundation
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise
Windows Server 2008 *	Windows Server 2008 Standard
	Windows Server 2008 Enterprise

* Includes 64-bit and 32-bit Editions unless otherwise stated.

The following appears on EXPRESSBUILDER.

- Windows Server 2008 64-bit Edition: Windows Server 2008 x64
- Windows Server 2008 32-bit Edition: Windows Server 2008 x86

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Regulatory Notices

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Class A Emission Compliance Statement/ Avis de conformité à la réglementation d'Industrie Canada:

CAN ICES-3(A)/NMB-3(A)

CE / Australia and New Zealand Statement

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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In the European Union

EU-wide legislation as implemented in each Member State requires that used electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes Information and Communication Technology (ICT) equipment or electrical accessories, such as cables or DVDs.

When disposing of used products, you should comply with applicable legislation or agreements you may have. The mark on the electrical and electronic products only applies to the current European Union Member States.

Outside the European Union

If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority and ask for the correct method of disposal.

Turkish RoHS information relevant for Turkish market

EEE Yönetmeliğine Uygundur

CCC声明

声明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板	×	○	○	○	○	○
HDD、DVD等	×	○	○	○	○	○
机箱、支架	○	○	○	○	○	○
电源	×	○	○	○	○	○
键盘	×	○	○	○	○	○
其他（电缆、鼠标等）	×	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下。
 ×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。

Vietnam RoHS information relevant for Vietnam market

Complying with "CIRCULAR, No.30/2011/TT-BCT (Hanoi, August 10 2011), Temporary regulations on content limit for certain hazardous substances in electrical products"



廢電池請回收

警告：

如果更換錯誤池會產生爆炸請以相同或同型電池更換使用

Declaration of Conformity

with the requirements of Technical Regulation on the Restriction Of the use of certain Hazardous Substances in Electrical and Electronic Equipment
(adopted by Order №1057 of Cabinet of Ministers of Ukraine)

The Product is in conformity with the requirements of Technical Regulation on the Restriction Of the use of certain Hazardous Substances in electrical and electronic equipment (TR on RoHS).

The content of hazardous substance with the exemption of the applications listed in the Annex №2 of TR on RoHS:

1. Lead (Pb) – not over 0,1wt % or 1000wt ppm;
2. Cadmium (Cd) – not over 0,01wt % or 100wt ppm;
3. Mercury (Hg) – not over 0,1wt % or 1000wt ppm;
4. Hexavalent chromium (Cr6+) – not over 0,1wt % or 1000wt ppm;
5. Polybrominated biphenyls (PBBs) – not over 0,1wt % or 1000wt ppm;
6. Polybrominated diphenyl ethers (PBDEs) – not over 0,1wt % or 1000wt ppm.

Декларація про Відповідність
Вимогам Технічного Регламенту Обмеження Використання деяких Небезпечних Речовин в
електричному та електронному обладнанні
(затвердженого Постановою №1057 Кабінету Міністрів України)

Виріб відповідає вимогам Технічного Регламенту Обмеження Використання деяких Небезпечних Речовин в електричному та електронному обладнанні (*ТР ОВНР*).

Вміст небезпечних речовин у випадках, не обумовлених в Додатку №2 ТР ОВНР, :

1. свинець (Pb) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон;
2. кадмій (Cd) – не перевищує 0,01 % ваги речовини або в концентрації до 100 частин на мільйон;
3. ртуть (Hg) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон;
4. шестивалентний хром (Cr6+) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон;
5. полібромбіфеноли (PBB) – не перевищує 0,1% ваги речовини або в концентрації до 1000 частин на мільйон;
6. полібромдефенілові ефіри (PBDE) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон.

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Веществ в электрическом и электронном оборудовании
(утверждённого Постановлением №1057 Кабинета Министров Украины)

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2. кадмий (Cd) – не превышает 0,01 % веса вещества или в концентрации до 100 миллионных частей;
3. ртуть (Hg) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей;
4. шестивалентный хром (Cr6+) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей;
5. полибромбифенолы (PBB) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей;
6. полибромдифеноловые эфиры (PBDE) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей.

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Keep this document nearby so that you may refer to it as necessary.

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This document was created based on the information available at the time of its creation. The screen images, messages and procedures **may differ from the actual screens, messages and procedures.** Substitute as appropriate when content has been modified.

The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

<http://www.nec.com/>



Precautions for Use (Be Sure to Read)

The following provides information required to use your server safely and properly. For details of names in this section, refer to *Names and Functions of Parts* in this document.

Safety precautions

Follow the instructions in this document for the safe use of the NEC Express server.

This User's Guide describes hazardous parts of the server, possible hazards, and how to avoid them. Server components with possible danger are indicated with a warning label placed on or around them (or, in some cases, by printing the warnings on the server).

In User's Guide or on warning labels, **WARNING** or **CAUTION** is used to indicate a degree of danger. These terms are defined as follows:



Indicates there is a risk of death or serious personal injury

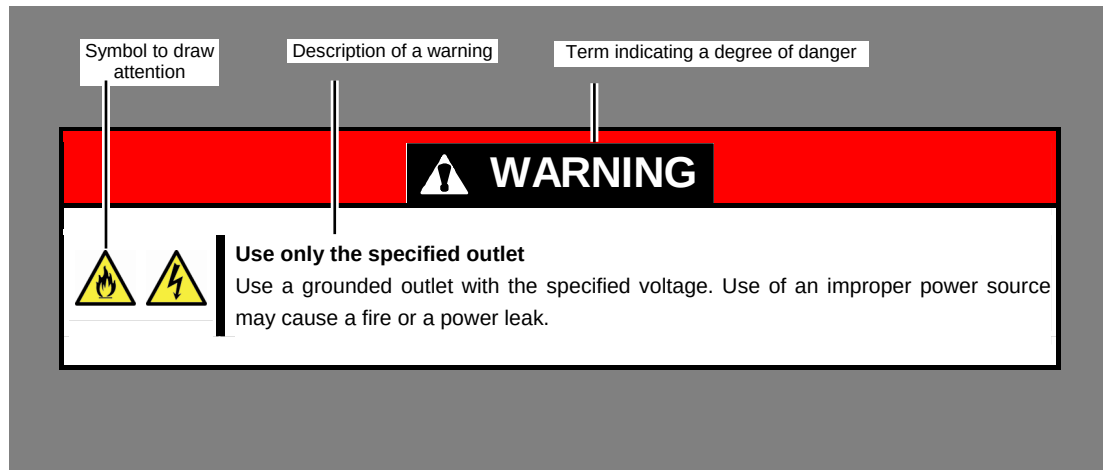


Indicates there is a risk of burns, other personal injury, or property damage

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	Attention	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example)  (Electric shock risk)
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example)  (Do not disassemble)
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example)  (Disconnect a plug)

(A label example used in this User's Guide)



Symbols used in this document and on warning labels

Attentions

	Indicates the presence of electric shock hazards.		Indicates the presence of mechanical parts that can result in bodily injury.
	Indicates the presence of a hot surface or component. Touching this surface could result in bodily injury.		Indicates the presence of mechanical parts that can result in pinching or other bodily injury.
	Indicates there is a risk of explosion.		Indicates the presence of laser beam that cause blindness.
	Indicates there is a risk of fire or fumes.		Indicates a general notice or warning that cannot be specifically identified.
	Indicates there is a risk of electric shock for the multiple receiving.		

Prohibited Actions

	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.		Do not touch the server with wet hand. Otherwise, an electric shock may be caused.
	Do not touch the component specified by this symbol. Otherwise, an electric shock or burn may be caused.		Do not use the server in the place where water or liquid may pour. Otherwise, an electric shock or fire may be caused.
	Do not place the server near the fire. Otherwise, a fire may be caused.		Indicates a general prohibited action that cannot be specifically identified.

Mandatory Actions

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.		Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.
	Make sure equipment is properly grounded. Otherwise, an electric shock or fire may be caused.		

Safety notes

This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, refer to *Safety precautions*.

General

 WARNING	
	Do not use the server for services where human life may be at stake or high reliability is required. This server is not intended for use in medical, nuclear, aerospace, mass transit or other applications where human life may be at stake or high reliability is required, nor is it intended for use in controlling such applications. We disclaim liability for any personal injury and property damages caused by such use of this server.
 	Do not use the server if any smoke, odor, or noise is present. If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact the store where you purchased the product or your sales representative. Using the server in such conditions may cause a fire.
 	Do not insert needles or metal objects. Do not insert needles or metal objects into ventilation holes in the server or openings in the optical disk drive. Doing so may cause an electric shock.
	Use a rack that conforms to the designated standard This server can be mounted onto a 19-inch rack that conforms to EIA standards. Do not mount the server onto any rack that does not conform to EIA standards. Doing so may cause a server malfunction, personal injury, or damage to peripheral devices. For more information about racks that can be used with the server, consult with your sales representative.
 	Use the server only under the specified environment Do not install the server rack in any environment that is not suitable for installation. Installation in an unsuitable environment is harmful for the server and other systems installed in the rack and may cause fire or personal injury due to the rack falling. For a detailed explanation on installation environments or seismic reinforcement, see the instruction manual supplied with the rack or consult with your sales representative.

 CAUTION	
  	Keep water or foreign matter away from the server. Do not let any liquid such as water or foreign materials including pins or paper clips enter the server. Failure to follow this warning may cause an electric shock, a fire, or failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server, and contact the store where you purchased the product or your sales representative.

Rack installation

CAUTION



Do not attempt to carry or install the server alone

More than two people are required to carry or install the rack. Otherwise, the rack may fall, resulting in personal injury or damage to peripheral devices. In particular, tall racks such as a 44U rack become unstable unless steadied with a stabilizer. Make sure that two or more people hold the rack to carry or install the rack.



Do not install with the load weight distributed unevenly

To avoid unevenly distributing the load of the rack and server, install a stabilizer or connect multiple racks to distribute the weight. Otherwise, the rack may fall, resulting in personal injury.



Do not install components alone, and check the door hinge pins of the rack

Two or more people are required to install the rack components such as the door or rails. When installing the door, make sure that both upper and lower hinge pins are held in place. Incomplete attachment may cause components to fall off as well as personal injury.



Do not extend any device from the rack that is not stabilized

When extending a device from the rack, make sure that the rack is stable (by using a stabilizer or seismic reinforcement). Otherwise, the rack may fall, resulting in personal injury.



Do not extend more than one device out of the rack

Extending multiple devices from the rack may cause the rack to fall, resulting in personal injury. Extend only one device at one time.



Do not exceed the rated capacity of the power supply when connecting devices

To prevent burn injuries, fire, and damage to the server, make sure the load on the branch circuit that supplies power to the rack will not exceed the rated load. For inquiries regarding the installation or wiring of the power supply system, consult with the company that performed the installation or wiring, or the power company that services your area.

Power supply and power cord use

WARNING



Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.



Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

CAUTION



Power supply cord

This server may be shipped with multiple power supply which requires more than one connector to AC mains.

The AC power cord(s) is consider as the mains disconnected device for the server, always disconnect the power supply cord(s) before opening up or servicing the server.



Power supply

The power supplies in your system may produce high voltages and energy hazards, which can cause bodily harm. Unless you are instructed otherwise, only trained service technicians are authorized to remove the covers and access of the components inside the system.



Plug into a proper power source.

Use a grounded outlet with the specified voltage. Use of an outlet with a voltage other than that specified causes fire and electrical leakage. Do not install the server in any environment that requires an extension cord. Connecting to a cord that does not conform to the power supply specs of the server causes overheating, resulting in fire.

If you want to use an AC cord set with a ground wire of class 0I, be sure to connect the ground wire before inserting the power plug into the outlet. Before disconnecting the ground wire, be sure to disconnect the power plug from the output.



Do not connect many cords into a single outlet by using extension cords.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.



Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

 CAUTION
Do not use any unauthorized interface cable.

Use only the interface cables provided with the server. Electric current that exceeds the amount allowed could cause fire. Also, observe the following precautions to prevent electrical shock or fire caused by a damaged power cord.



- Do not stretch the cord harness
- Do not bend the power cord.
- Do not twist the power cord
- Do not step on the power cord.
- Uncoil the power cord before use
- Do not secure the power cord with staples or equivalents
- Do not pinch the power cord
- Keep chemicals away from the power cord
- Do not place any object on the power cord
- Do not alter, modify, or repair the power cord
- Do not use a damaged power cord (replace the damaged power cord with a power cord of the same standard. For information on replacing the power cord, contact the store where you purchased the product or a sales representative)

**Do not use the attached power cord for any other devices or usage.**

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

**Do not pull out a cable by gripping the cable part.**

Pull a cable straight out by gripping the connector part. Pulling a cable by gripping the cable part or applying extra pressure to the connector part may damage the cable part, which may cause a fire or electric shock.

Installation, relocation, storage, and connection

CAUTION



Do not attempt to lift the server by holding the front bezel.

Securely hold the server by the base to move or lift. Do not attempt to lift it by holding the front bezel. Doing so may cause the front bezel to come off, which may cause not only breakage of the server but also cause the server to fall on to persons resulting in personal injury.



Do not install the server in any place other than specified.

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- A dusty place
- A humid place such as near a boiler
- A place exposed to direct sunlight
- An unstable place



Do not use the server in an environment where corrosive gas is present

Do not install the server in a place subject to corrosive gases including sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, or ozone. Do not install the server in an environment that contains dust, chemicals that accelerate corrosion such as NaCl or sulfur, or conductive materials. Failure to follow this warning may cause the wiring on the printed wiring board to short-circuit, leading to fire. If you have any questions, contact the store where you purchased the product or a sales representative.



Do not install the server while the cover is removed

Do not install the server to a rack while the cover or other relevant items removed. Not only will the cooling effect within the server decrease, causing the server to malfunction, but also may allow dust to enter the server, resulting in fire or electrical shock.



Do not get your fingers caught in the rails

When mounting/removing the server onto/from the rack, be careful to avoid getting your fingers caught in the rails or cutting your fingers on the rails.



Do not apply any weight on the server when it is extended from the rack

Do not apply force on the server when it is extended from the rack. Doing so cause the frames to bend, which makes it impossible to be mounted on the rack. It also may cause the server to fall, resulting in personal injury.



Do not attempt to connect or disconnect the interface cable while the power cord is plugged into an outlet

Be sure to unplug the power cord from a power outlet before connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching a cable or connector may cause an electric shock or a fire resulted from a short circuit.

CAUTION**Use only the specified interface cable.**

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.

Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server with loose cable connections.
- Do not use any damaged cable.

Cleaning and working with internal devices

WARNING**Do not disassemble, repair, or alter the server.**

Never attempt to disassemble, repair, or alter the server on any occasion except as described in this document. Failure to follow this warning may cause not only malfunction of the server but also an electric shock or fire.

**Do not attempt to remove lithium, NiMH, or Li-ion batteries by yourself.**

The server contains the lithium, NiMH, or Li-ion battery (some optional devices have a lithium, NiMH, or Li-ion battery installed). Do not remove the battery by yourself. Placing a battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead battery, contact the store you purchased the product or your sales representative. Do not attempt to disassemble the server to replace or recharge the battery by yourself.

Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the NEC. Do not dispose of batteries in a fire or with household waste. Contact your local waste disposal agency for the address of the nearest battery deposit site

**Disconnect the power plug before cleaning the server.**

Be to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even of the server is off-powered.

Occasionally disconnect the power plug from the outlet and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ CAUTION**High temperature**

Components including internal hard disk drives in the server are extremely hot just after the server is turned off. Allow the surface to cool before installing/removing.

**Secure cables or cards in place**

Be sure to secure the power cord, interface cables, and cards in place. Incomplete installation causes a loose connection, resulting in smoke or fire

**Electric shock**

The hard disk drives and power supply unit (only when two redundant power supplies are installed) support hot swapping. If replacing a component when the electrical current is being supplied, use extreme caution not to get electric shock by touching terminal parts of the internal components.

During operation**⚠ CAUTION****Do not pull out or remove the server from the rack.**

Do not pull the server out of the rack or remove it from the rack. In addition to causing equipment to not function properly, separating the server from the rack may result in personal injury.

**Avoid contact with the server during thunderstorms.**

Do not touch any part of the server including the cables when a thunderstorm is approaching. Also, do not connect or disconnect any devices. There may be a risk of electric shock from lightning strike.

**Keep animals away from the server.**

Keep animals such as pets away from the server. Pet hair or other waste enters the server, which may cause a fire or electric shock.

**Do not leave the optical disk drive tray open.**

Dust may get in the server when the tray is open, which may result in a malfunction. In addition, bumping the open tray could cause personal injury.

**Do not remove the server from the rack while it is operating.**

Do not pull out or remove the server from the rack while the server is running. In addition to causing equipment to not function properly, separating the server from the rack may result in personal injury.

**Do not place any object on top of servers.**

Separating the server from the rack may result in personal injury and damage to nearby personal belongings.

**Do not get yourself caught in the fan**

Keep your hands and hair away from the cooling fan at the rear of the server during operation. Failure to observe this warning may cause your hands or hair to catch in the fan, resulting in personal injury.

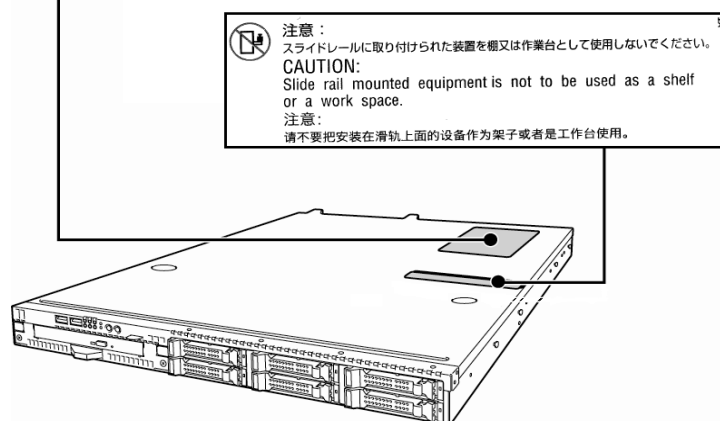
Warning labels

The warning labels are attached on or near the components with potential hazards (this label is either attached or printed on the component) to draw attention from users to potential hazards involved in handling the server. (Do not remove or black out this label and keep it clean.) If no label is attached or printed on the server, or if there is a label coming off or stained, contact the store where you purchased the product.

External view



2.5-inch drive model



3.5-inch drive model

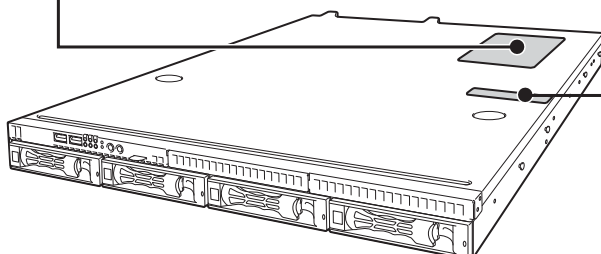
 注 意 CAUTION	
高温になるコンポーネントがあります。十分に冷えてから搬送するようにして下さい。 As some components may become very hot during system operation, give ample time to allow cooling while using as well as precaution when handling internal components immediately after powering down. 有る部品可能會達到高溫。請注意待其冷卻之後再接觸。 有る組件可能會達到高溫。請注意須等冷卻之後再接觸。 電源を切ってもバッテリーで稼働している部分があります。 保守をする前に各々のコンポーネントの取り扱い説明書をお読みください。 Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance. 即使切斷電源、有的組件也會依靠電池運轉。 在进行维护之前，请认真阅读各组件的使用说明书。 即使切斷電源、有的組件也會依靠電池運轉。 在进行維護之前，請詳細閱讀各組件的使用說明書。 電源の切斷を行わず、取り出した電源プラグをコンセントから抜き、外装筐体と接続しているケーブルを外して下さい。 Disconnect all AC power cords from both system and external peripherals prior to installing/removing options. 进行可選配件的安裝和拆卸時，請先从插座拔下電源插頭并分离与外部設備間的纜線。 進行選請設備安裝和拆卸時，請先從電源插座從插頭中拔出，並取下與外部設備連接的纜線。 システム内部へ熱い部とさないでください。十分に注意下さい。 Do not drop any screws inside the system. 請一定注意不要丟螺絲掉入設備內部。 請注意絕對不要將螺絲掉入設備內部。 ポート及びオプション機器の接続の際は、必ずユーザーズガイドを参照し、正しく接続して下さい。 當地的安裝時，故障や火災の原因となります。 Refer to "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents. 連接板卡及可選設備時，請務必參照“用戶指南”進行正確連接。 連接錯誤，有可能造成故障或火災。 安裝控制卡及選裝設備時，請務必參照“用戶指南”進行正確連接。 連接錯誤時，可能會造成故障或火災。 指をささないで、取り扱いをしないように十分に注意して下さい。 To avoid the risk of personal injury, be careful when accessing the inside of the system. 請小心不要夾傷或碰傷手指。 請注意不要夾傷手指、或因碰撞而受傷。 装置の持ち上げ、移動の際は、装置の底面をしっかりと持ち上げて下さい。 Firmly hold the bottom of the system when required to lift and carry the system. 抬起、移動設備時，請牢固抓住設備底部將其抬起。 抬起、搬運伺服器時，請牢固抓住設備底部將其抬起。	      



注意：
スライドレールに取り付けられた装置を欄又は作業台として使用しないでください。

CAUTION :
Slide rail mounted equipment is not to be used as a shelf
or a work space.

注意：
请不要把安装在滑轨上面的设备作为架子或者是工作台使用。



Handling precautions (for proper operations)

Be sure to observe the following precautions for the proper functioning of the server. Ignoring the precautions may cause server malfunction or failure.

- Do not use any cell phone or PHS and switch off them near the server. Electric waves from such devices can cause server to malfunction.
- Install the server in an appropriate place. For details about the installation location, refer to *Chapter 2 Preparations (2. Installation and Connection)*.
- Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord, if they are non plug-and-play devices.
- Connect the provided power cord to a 100/200 VAC outlet.
- Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.
- Wait for at least 30 seconds (When using N8103-152 RAID Controller, it is 90 seconds) before turning on the server after turning off the server. If any Uninterruptible Power Supply unit is connected, set it to wait for at least 30 seconds (When using N8103-152 RAID Controller, it is 90 seconds) before turning on the server after power off.
- Turn off the server and unplug the power cord before moving it.
- Regularly clean the server to prevent various types of failure. (Refer to *Chapter 1 Maintenance (2. Daily Maintenance)* in "Maintenance Guide" for details about cleaning.)
- Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.
- We do not guarantee that any copy-protected CD that does not conform to standards will play on the CD player.
- Make sure that optional devices you are going to install are supported for use with the server. Even if they are successfully installed or connected, installation of unsupported devices can cause the server to malfunction or even failure.
- In the following cases, check and adjust the system clock before operation.
 - After transportation
 - After storage
- After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 10°C to 40°C; humidity: 20% to 80%). Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if high accuracy timing is required by the system.
- In order to get the server and internal devices to work properly, we recommend you store the server at room temperature.

Observe the storage conditions (Temperature: -10°C to 55°C, Humidity: 20% to 80%, No condensation of moisture) to store the server.

- If this server, internal optional devices, and media set for the backup devices (tape cartridges) are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and failures when these are used in such state. To protect important stored data and property, make sure to wait for a sufficient period to use the server and components in the operating environment.

Reference: Time effective at avoiding condensation in winter (more than 10°C differences between the room temperature and atmospheric temperature)

- Disk devices: Approximately 2 to 3 hours
- Tape media: Approximately 1 day
- For optional devices, we recommend you use our NEC products. Some memory or hard disk drive manufactured by other companies are supported for use with this server, however, you will be charged to repair failure or damage caused by use of such products even within warranty period.

Anti-Static Measures

This product contains static-sensitive electronic components. Follow the measures below to avoid a failure caused by static electricity when installing or uninstalling any optional device.

- **Wearing Anti-static Wrist Strap or Anti-static Gloves**

Wear a wrist strap on your wrist and connect the wire to the chassis. If there is no wrist strap, touch an unpainted metal surface of the chassis connected to the ground to discharge static electricity from your body before touching the component. Touch the metal part occasionally to discharge the static electricity while working on the component.

- **Checking the Workplace**

- Work on an anti-static floor or concrete floor.
- If you work on a place where static electricity is likely to be generated (e.g. carpet), be sure to provide anti-static protection.

- **Using the Work Table**

Place the server on a mat with Electrostatic Discharge (ESD) protection.

- **Clothing**

- Do not wear wool or synthetic clothes.
- Wear anti-static shoes.
- Remove any kind of metal accessories such as a ring, bracelet or wrist watch.

- **Handling of Components**

- Keep the component in an anti-static bag until you install it to the server.
- Hold the component by the edges to avoid touching any terminals or mounting parts.
- Place the component in an anti-static bag when storing or moving them.

- **Handling of Cables**

When connecting a cable (e.g., LAN cable), static electricity may also be charged due to friction against the floor.

Connecting the charged cable with an I/O device may cause damage to the devices in the system. It is recommended to use a product such as electrostatic discharge kit to eliminate the static charge before connecting the cable.

- **Installing and Uninstalling the Optional Device**

- To avoid electric hazard and malfunction, be sure to turn off the power switch of the server and unplug the power cord from the outlet before installing or uninstalling any optional device. If the device is hot-swappable, you do not need to turn off the power switch and unplug the power cord.
- The device contains static-sensitive electronic components. When installing or uninstalling the optional device, wear an anti-static wrist strap on your wrist to avoid a failure caused by the static electricity. To use the strap, connect the wire to the chassis.

Tips for your health and safety

Using a computer extensively may affect different parts of your body. Here are tips you should follow while working on a computer to minimize strain on your body.

Keep proper posture

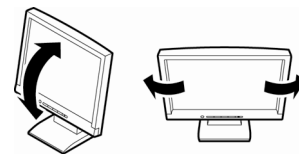
The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when your muscles are most relaxed.

Working on the computer with bad posture such as hunching over or being too close to the monitor could cause fatigue or deteriorated eyesight.



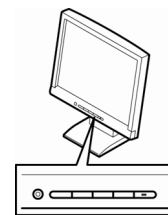
Adjust the angle of your display

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. Working without adjusting the display to a comfortable angle makes it difficult for you to maintain a proper posture and you will get tired easily. Adjust the viewing angle before use.



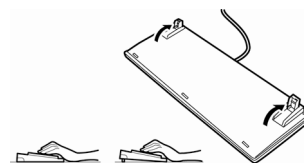
Adjust the brightness and contrast of the display

Display screens have functions to control brightness and contrast. The most suitable brightness/contrast depends on age, individuals, and environment, so adjust it to suit your preferences. A too bright or too dark display is bad for your eyes.



Adjust the angle of keyboard

Some keyboards are ergonomically designed, which allow the angle to be adjusted. Adjusting the angle of the keyboard is effective to reduce tension on your shoulders, arms, and fingers.



Clean your equipment

Keeping your equipment clean is important not only for the appearance but also for functional and safety reasons. A dusty monitor makes it difficult to see the display contents, so clean it regularly.

Take rest breaks

When you feel tired, take a break. Light exercise is also recommended.



NEC Express5800 Series Express5800/R110f-1E

1

General Description

This chapter introduces the features of this server and the name of each part.

1. Introduction

2. Accessories

Verify the condition of your server's accessories.

3. Standard Features

Check and maintain the server system by using the functions explained in this section.

4. Names and Functions of Parts

This section describes the name of each part contained in this server.

1. Introduction

Thank you for purchasing this NEC Express5800 Series product.

This high performance server is powered by the latest microprocessor "Intel® Xeon® processor".

NEC's latest technology and architectures realize high-power and high-speed operation that cannot be matched by existing servers.

The server is designed with consideration of not only reliability but also expandability, which enables you to use it as a network server.

Read this document before using the server thoroughly to fully understand handling of Express5800 Series Server and appreciate its functions to the maximum extent.

2. Accessories

The carton box contains various accessories which are required for setup or maintenance. **Make sure you have them all** for future use.

- The tool used for removing slide rails (outer rails)
- EXPRESSBUILDER^{*1}
- Getting Started
- Cable ties (for securing AC power cord)
- SDR Update CD-ROM
- Power cord

*1 Documents are stored in EXPRESSBUILDER. Adobe Reader is required to read the documents so make sure you have it installed in your PC.

Make sure you have all accessories and inspect them. If an accessory is missing or damaged, contact your sales representative.

3. Standard Features

The server has the following standard features:

High performance

- Intel® Xeon® processor
- High-speed memory access (DDR3L 1600 supported)
- High-speed disk access (SATA2 6 Gbps, SAS 6 Gbps supported)
- High-speed 1000BASE-T (2 ports) interface (1Gbps/100Mbps/10Mbps supported)

High reliability

- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- RAID System (Disk Array) (also available as an option)
- Auto rebuild function (hot swapping supported)
- BIOS password feature
- The security lock that comes with Front Bezel
- Redundant Fan (optional)
- Redundant Power Unit

Management Utilities

- NEC ESMPRO
- ExpressUpdate
- Remote controlling feature (EXPRESSSCOPE Engine 3)
- RAID System management utility (Universal RAID Utility)
- Hard disk drive monitoring

Power saving and noiseless design

- Power monitoring feature
- Power control feature
- 80 PLUS® Platinum certified high efficiency power supply unit (for non-redundant power supply)
- 80 PLUS® Gold certified high efficiency power supply unit (for redundant power supply)
- Fan control appropriate to environment, work load, and configuration
- Enhanced Intel SpeedStep® Technology supported

Expandability

- PCI Express 3.0 (x16 lanes): 1 slot (low profile)
- PCI Express 2.0 (x4 lanes): 1 slot (low profile)
- Large capacity memory of up to 32 GB
- Hard disk drive bay
 - 2.5-inch drive model: Standard 6 slots, 8 slots max. (optional; cannot be used if using optical disk drive)
 - 3.5-inch drive model: 4 slots
- Optical disk drive bay provided as standard
- USB3.0 interface (Only when the OS and USB ports support this interface)
- Three LAN ports (one for management LAN)

Ready to use

- Hard disk drives can be installed with one-touch setup, which requires no cables (hot swap supported)

Many built-in Features

- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Power switch mask
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis utility

Easy setup

- EXPRESSBUILDER (setup utility)
- SETUP (BIOS SETUP utility)

Maintenance features

- Off-line tools
- Memory dump feature using the DUMP switch
- Feature to back up and restore BIOS/BMC settings using the EXPRESSSCOPE profile key

3.1 Management Features

The hardware components of the server provide operation control/reliability features as shown below. Additionally, *NEC ESMPRO Agent*, which is provided in EXPRESSBUILDER, enables you to collectively manage the state of your systems. You can also monitor the server states from a PC to manage the network where *NEC ESMPRO Manager* provided in EXPRESSBUILDER is installed.

The features available on this server are as shown in the table below.

Function		Availability	Description
Hardware			Shows physical hardware information.
	Memory bank	○	Shows physical memory information.
	Device info	○	Shows information specific to the server.
	CPU	○	Shows physical CPU information.
System		○	Shows logical CPU information and monitors the load factor. Shows logical memory information and monitors the status.
I/O device		○	Shows information on I/O devices (floppy disk drive, serial ports, parallel ports, keyboard, mouse, and video).
System environment			Monitors temperatures, fans, voltage, power supply, doors, and others.
	Temperature	○	Monitors the temperature inside of the chassis.
	Fan	○	Monitors the fans.
	Voltage	○	Monitors the voltage inside of the chassis.
	Power supply	○	Monitors the power supply unit.
	Door	×	Monitors chassis intrusion (open/close of the covers and doors on the chassis).
Software		○	Shows service, driver, and OS information.
Network		○	Shows network (LAN) information and monitors packets.
BIOS		○	Shows BIOS information.
Local polling		○	Monitors the values of MIB items obtained by NEC ESMPRO Agent.
Storage		○	Monitors controllers and storage devices including hard disk drives.
File system		○	Shows the file system configuration and monitors the free space.
RAID System		○	Monitors the following RAID Controllers: • On-board RAID Controller (LSI Embedded MegaRAID) • Optional RAID Controller
Others*		○	Monitors OS stall using the Watch Dog Timer.
		○	Performs alert processing after an OS STOP error occurs.

○: Supported. △: Partially supported. ×: Unsupported.

*: Not displayed on the NEC ESMPRO Manager screen.

Tips

NEC ESMPRO Manager and NEC ESMPRO Agent are supplied with the server as standard. For how to install and use each software component, refer to the explanation of the component.

3.2 Firmware and Software Version Management

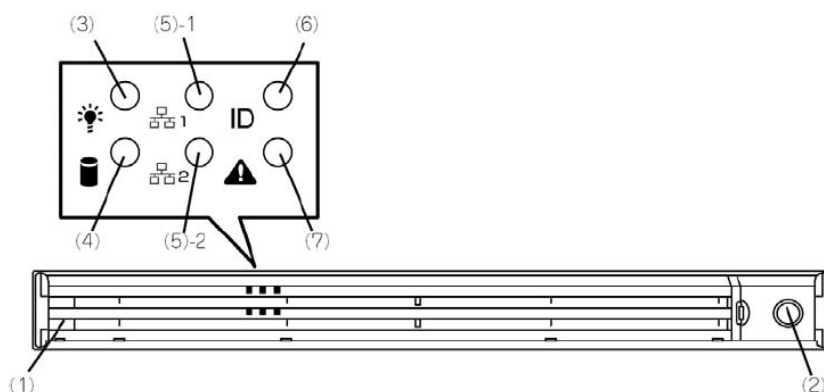
Use of NEC ESMPRO Manager and ExpressUpdate Agent allows you to manage versions of firmware and software as well as update them by applying update packages.

This function automatically updates multiple modules without stopping the system just by specifying the application of an update package from NEC ESMPRO Manager.

4. Names and Functions of Parts

This section describes the names of the server parts.

4.1 Front View



(1) Front Bezel (optional)

The cover to protect the front and top of the server. Front Bezel can be locked with the provided Bezel Lock Key.

(2) Key slot

The key slot for Bezel Lock Key that is used to lock Front Bezel.

(3) POWER LED (green/amber)

After the power cord is connected, this LED lights amber during initialization of system.

This LED lights green when the power is ON.

(4) Disk Access LED (green/amber)

This LED lights or flashes green when the internal hard disk drive or optical disk drive is being accessed.

The LED lights amber if a hard disk drive error occurs.

(5) LINK/ACT LED (green)

This LED turns on when the server is connected to the network.

Sequential numbers 1 and 2 indicate LAN connectors 1 and 2, respectively.

(6) Unit ID (UID) LED (blue)

This LED turns on when the UID switch is pressed.

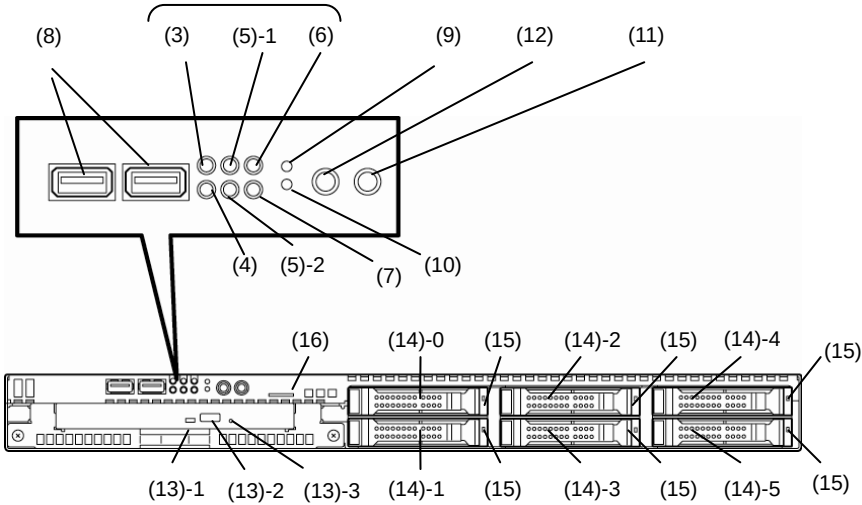
Commands from the software also cause it to turn on or flash.

(7) STATUS LED (green/amber)

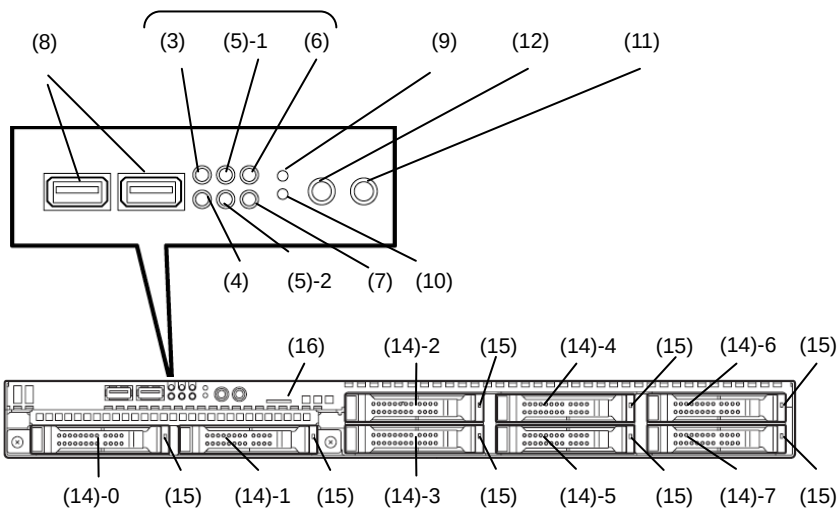
This LED indicates the server status. It lights green when the server is operating normally. If an abnormality is detected, it turns on or flashes amber.

4.2 Front View (with Front Bezel Removed)

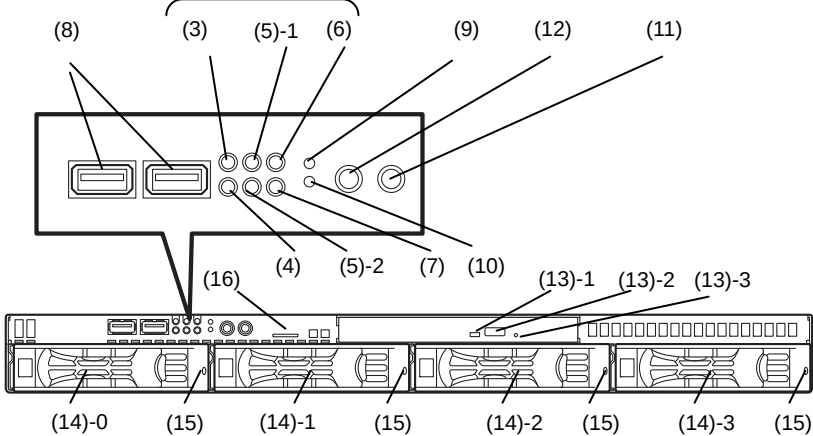
2.5-inch drive model: x6 HDD model



2.5-inch drive model: x8 HDD model



3.5-inch drive model



(8) USB connectors (front)

These connectors are used to connect devices that support the USB interface.

Blue connector: for USB3.0

Black connector: for USB2.0

(9) BMC RESET Switch

The switch to reset BMC of this server. Use the switch only when there is something wrong with EXPRESSSCOPE Engine 3 (BMC).

To use this switch, press it at least five seconds.

(10) DUMP Switch (NMI)

When the switch is pressed, memory dump is performed.

(11) POWER Switch

The switch to turn the server on and off. Press once to turn on the server. POWER LED lights when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off the server.

(12) Unit ID (UID) Switch

The switch to turn on and off the UID LEDs provided at the front and rear of the server. Pressing the switch once turns on the UID LED and pressing once more turns off the LED. Commands from the software also cause it to turn on or flash.

(13) Optical disk drive bay

Either of the following drives can be installed.

– DVD-ROM drive

– DVD SuperMULTI drive

(13) - 1 Access LED for optical disk

(13) - 2 Eject button

(13) - 3 Emergency eject hole

(14) 2.5-inch/3.5-inch hard disk drive bay

The bay where hard disk drives are installed. The sequential numbers indicate the corresponding bay numbers. All bays include dummy trays.

(15) DISK LED (green/amber)

The LED provided for each hard disk drive

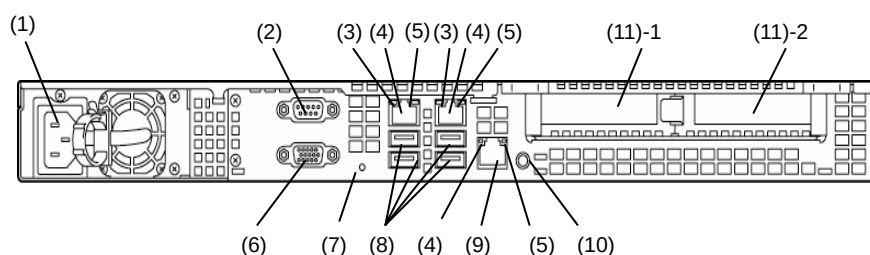
This LED light turns green when a hard disk drive is being accessed. The light turns amber if a hard disk drive is broken and it flashes green and amber alternately when a hard disk drive is being rebuilt. (Only applied to RAID System)

(16) Pull-out Tab

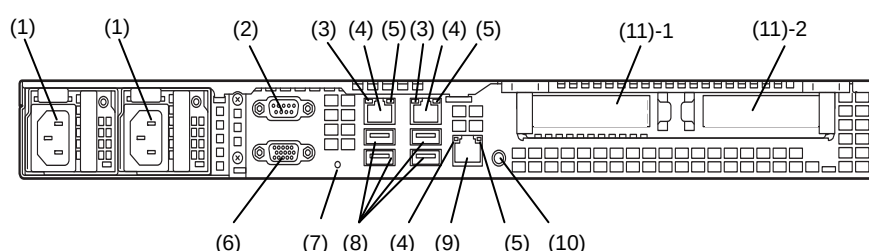
A label indicating the part number and serial number of the server is located on Pull-out Tab.

4.3 Rear View

<Non-Redundant Power Supply Unit Model>



<Redundant Power Supply Unit Model>



(1) AC Inlet

This socket is used to connect the power cord.

(2) Serial port A (COM A) connector

This connector is used to connect devices that support a serial interface. Note that it is not possible to directly connect to a dedicated line.

(3) LINK/ACT LED (green)

The LED indicates the access status of LAN.

(4) LAN connectors

LAN connectors that support

1000BASE-T/100BASE-TX/10BASE-T.

If Shared BMC LAN feature is enabled in ROM Utility, LAN connector 1 can also be used as the management LAN connector. However, sharing port is not recommended from the point of performance and security, because LAN port 1 may receive both data.

(5) SPEED LED (green/amber)

The LED indicates the transfer speed of LAN ports.

(6) Display connector

The connector to connect a display.

(7) DC Power LED (green)

During BMC initialization, this LED lights amber. This LED lights green when the power is ON.

(8) USB connectors

These connectors are used to connect devices that support the USB interface.

(9) Management LAN connector

LAN connector that supports 100BASE-TX/10BASE-T.

This port cannot be used as a data transmission port. This port is used for connecting to EXPRESS SCOPR ENGINE 3. This port is disabled when Shared BMC LAN feature is used.

(10) UID (Unit ID) switch/LED (blue)

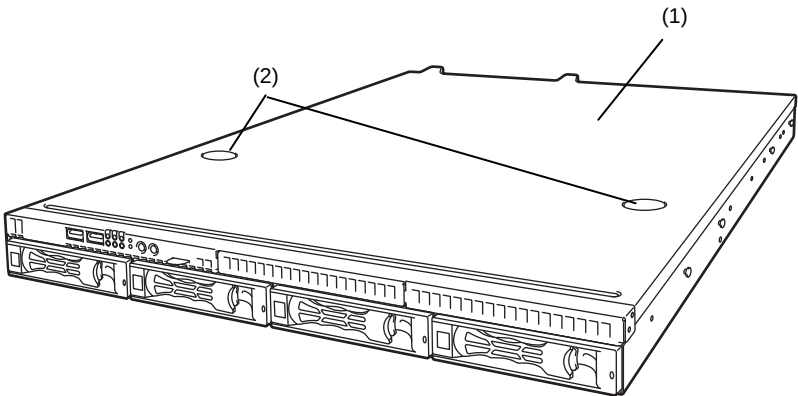
The switch to turn on and off the UID LEDs provided at the front and rear of the server. Pressing the switch once turns on the UID LED and pressing once more turns off the LED.

(11) PCI slot

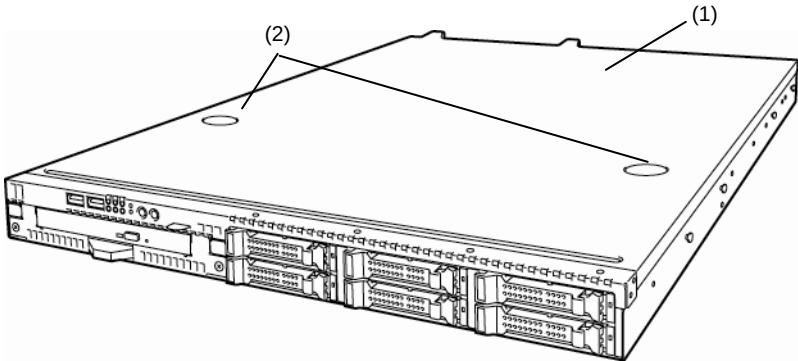
The slot is used to install the low profile type PCI board. The sequential numbers indicate the corresponding slot numbers.

4.4 External View

3.5-inch drive model



2.5-inch drive model

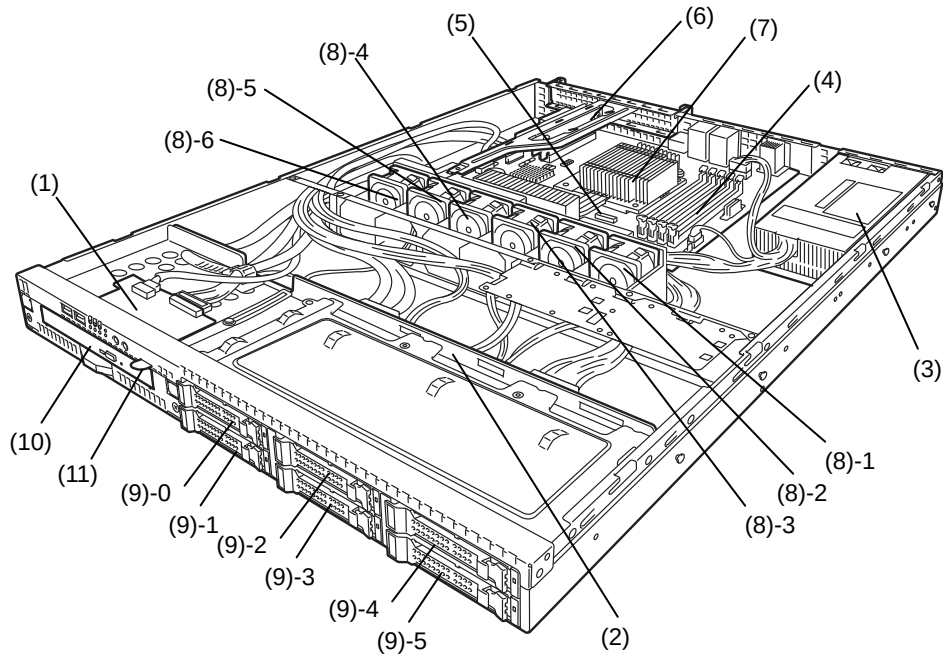


- (1) Top cover
- (2) Release button

4.5 Internal View

The images below do not show the duct.

2.5-inch drive model (non-redundant fan / non-redundant power supply / x6 HDD model)



- (1) Front panel board

(2) Backplane

(3) Power supply unit

(4) DIMM (optional)

(5) Motherboard

(6) PCI riser card

(7) Processor (attached under the heat sink)
- (8) Cooling fan

-1 BPB_FAN1

-2 BPB_FAN3

-3 BPB_FAN5

-4 BPB_FAN7

-5 BPB_FAN9

-6 BPB_FAN11

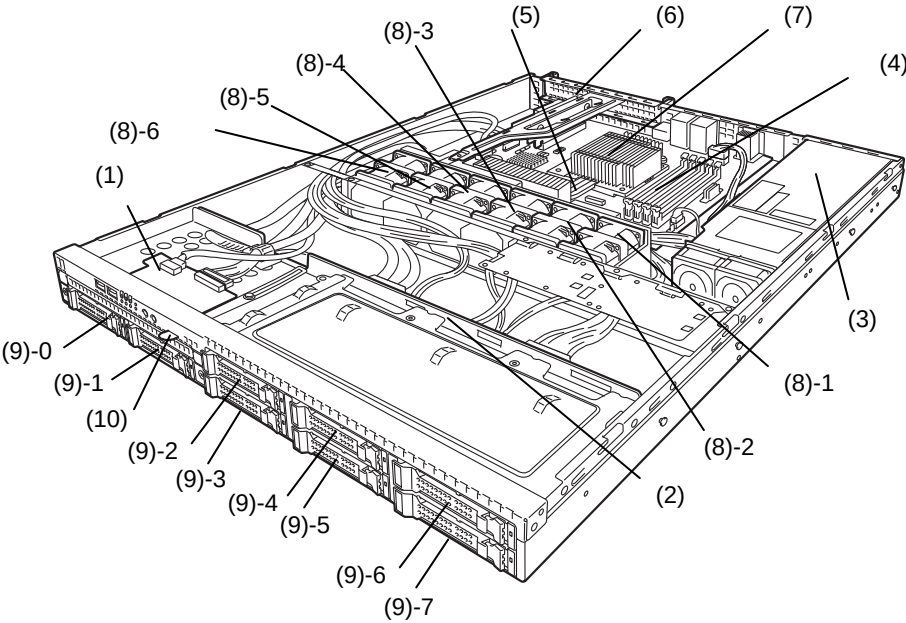
(9) 2.5-inch hard disk drive bay

The sequential numbers indicate the corresponding bay numbers.

(10) Optical disk drive (optional)

(11) Pull-out tab

2.5-inch drive model (redundant fan / redundant power supply / x8 HDD model)



- (1) Front panel board

(2) Backplane

(3) Power supply unit

(4) DIMM (optional)

(5) Motherboard

(6) PCI riser card

(7) Processor (attached under the heat sink)
- (8) Cooling fan

-1 BPB_FAN1

BPB_FAN2

-2 BPB_FAN3

BPB_FAN4

-3 BPB_FAN5

BPB_FAN6

-4 BPB_FAN7

BPB_FAN8

-5 BPB_FAN9

BPB_FAN10

-6 BPB_FAN11

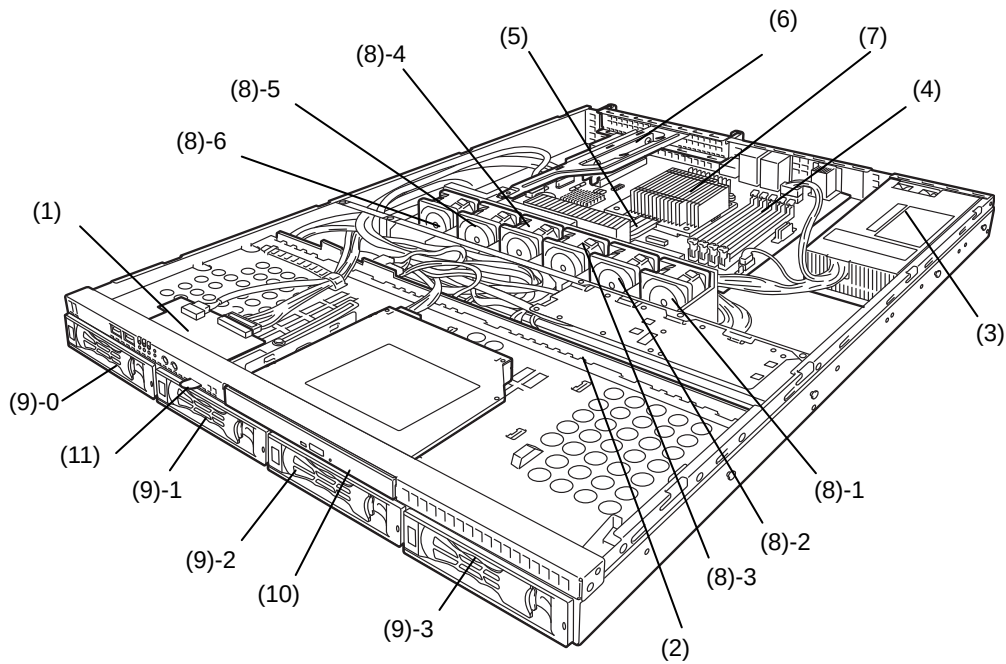
BPB_FAN12

(9) 2.5-inch hard disk drive bay

The sequential numbers indicate the corresponding bay numbers.

(10) Pull-out tab

3.5-inch drive model (non-redundant fan / non-redundant power supply model)



- (1) Front panel board

(2) Backplane

(3) Power supply unit

(4) DIMM (optional)

(5) Motherboard

(6) PCI riser card

(7) Processor (attached under the heat sink)
- (8) Cooling fan

-1 BPB_FAN1

-2 BPB_FAN3

-3 BPB_FAN5

-4 BPB_FAN7

-5 BPB_FAN9

-6 BPB_FAN11

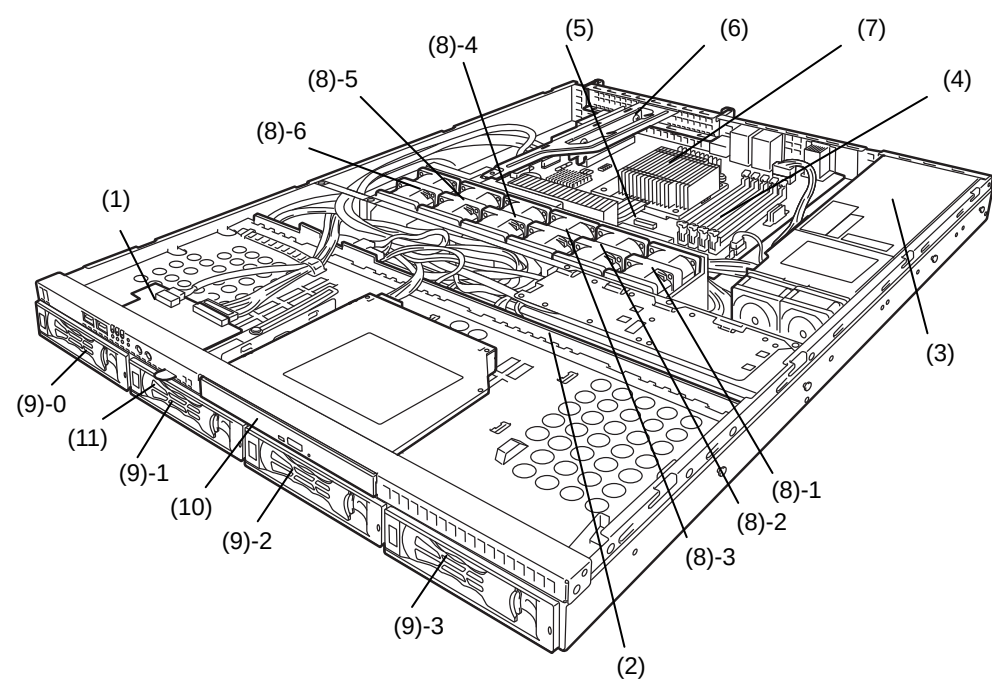
(9) 3.5-inch hard disk drive bay

The sequential numbers indicate the corresponding bay numbers.

(10) Optical disk drive (optional)

(11) Pull-out tab

3.5-inch drive model (redundant fan / redundant power supply model)



- (1) Front panel board

(2) Backplane

(3) Power supply unit

(4) DIMM (optional)

(5) Motherboard

(6) PCI riser card

(7) Processor (attached under the heat sink)
- (8) Cooling fan

-1 BPB_FAN1

BPB_FAN2

-2 BPB_FAN3

BPB_FAN4

-3 BPB_FAN5

BPB_FAN6

-4 BPB_FAN7

BPB_FAN8

-5 BPB_FAN9

BPB_FAN10

-6 BPB_FAN11

BPB_FAN12

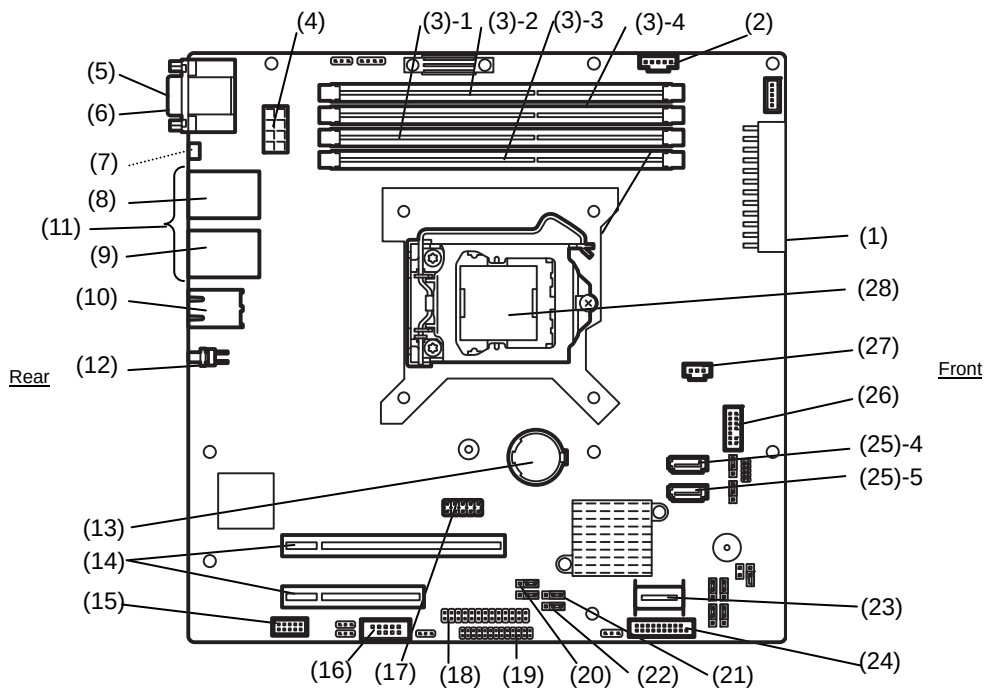
(9) 3.5-inch hard disk drive bay

The sequential numbers indicate the corresponding bay numbers.

(10) Optical disk drive (optional)

(11) Pull-out tab

4.6 Motherboard



- | | |
|--|--|
| <p>(1) Power connector</p> <p>(2) PM-BUS connector</p> <p>(3) DIMM slots
(the number after hyphen indicates slot number)</p> <p>(4) Power connector (CPU)</p> <p>(5) Serial port (COM A) connector</p> <p>(6) VGA connector</p> <p>(7) Power lamp (rear)</p> <p>(8) LAN1 connector</p> <p>(9) LAN2 connector</p> <p>(10) LAN connector for management</p> <p>(11) USB connector (rear)</p> <p>(12) UID switch (rear)</p> <p>(13) Lithium battery</p> <p>(14) PCI riser card connector (dedicated to low profile cards)
For the supported card specifications, refer to <i>Chapter 2 (1.11 PCI card)</i>.</p> <p>(15) SPI Flash Mezzanine connector
SPI flash memory has been installed, where BIOS and BMC configuration data is stored. Move it when replacing MB to keep using the data.</p> | <p>(16) Serial port (COM B) connector</p> <p>(17) Internal Flash Memory connector</p> <p>(18) Front panel connector</p> <p>(19) HDD BP connector</p> <p>(20) CMOS clear jumper switch</p> <p>(21) RAID switch jumper</p> <p>(22) Password clear jumper</p> <p>(23) SAS/Serial ATA connector</p> <p>(24) USB connector (front)</p> <p>(25) Serial ATA connector
(the number after hyphen indicates connector number)</p> <p>(26) TPM Kit connector</p> <p>(27) SGPIO connector</p> <p>(28) Processor (CPU) socket</p> |
|--|--|

* Only the connectors used for server upgrades and maintenance (such as replacing parts) are listed here. Use other connectors or parts without any change.

4.7

Status Indicators

This section explains the indication and meanings of the server LEDs.

4.7.1

POWER LED (💡)

POWER LED lights amber during initialization of the system. You can power on the server after the amber POWER LED goes off.

POWER LED lights green when the server is on.

4.7.2

STATUS LED (⚠️)

While hardware is operating normally, STATUS LED lights green. STATUS LED is off or lights/flashes amber if there is a problem with hardware.

The following table lists STATUS LED patterns, their explanation and solution.

Tips

Once you have installed NEC ESMPRO, you can reference error logs to check the causes of failures.

Status LED pattern	Explanation	Solution
On (green)	Normal state	—
Flashing (green)	Memory is in a degraded state	Identify the device in degraded state by using the BIOS setup utility <i>SETUP</i> , and replace it as soon as possible.
	An uncorrectable memory error has often occurred.	
	Operating while CPU error is detected.	
Off	The power is off.	Turn on the server.
	POST is in progress.	The STATUS LED will turn green after POST completes.
	Watchdog timer expired.	Turn the power off and then turn it on. If the POST screen displays any error message, take notes of the message, and contact your sales representative.
	An uncorrectable error in memory is detected.	
	A PCI system error occurred	
	Memory dump is being requested. (e.g. when DUMP switch NMI is pressed) Note It remains green if the dump is caused by software.	Wait until the memory dump is completed.

Status LED pattern	Explanation	Solution
On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A voltage alarm was detected.	Contact your sales representative.
	A CPU temperature alarm was detected.	
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays any error message, take notes of the message, and contact your sales representative.
	SMI timeout is detected	Contact your sales representative.
	Sensor error was detected.	
Flashing (amber)	The power supply unit is broken.	Contact your sales representative.
	A fan alarm was detected.	Check if the internal fan cable is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change when the fans are normal, contact your sales representative.
	A voltage warning was detected	Contact your sales representative.
	One or more hard disk drives are broken when the RAID System is configured.	

4.7.3 LINK/ACT LED (1, 2)

The LED lights green when it is connecting to LAN and flashes when transmitting or receiving data on LAN. The number next to the icon indicates a network port number.

4.7.4 Disk Access LED ()

DISK Access LED indicates the status of the hard disk drive installed in the hard disk drive bay.

The LED lights green every time the hard disk drive or optical disk drive is being accessed.

Lighting amber indicates that the hard disk drive is broken. The status of the broken hard disk drive can be checked with DISK LED provided for each hard disk drive.

4.7.5 Optical Disk Access LED

The LED for optical disk drive at the front of the server flashes when a CD or DVD is being accessed.

4.7.6 UID LED (ID)

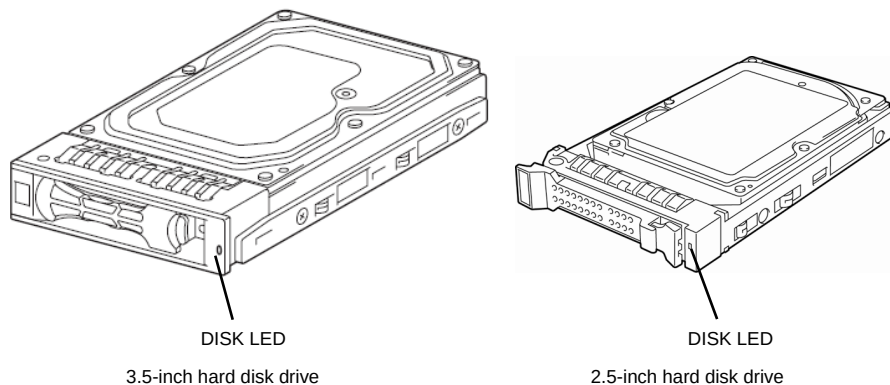
The UID LED is provided one each at the front and rear of the server. If you press the UID switch provided at the front or rear of the server, the light turns on. If you press it again, the light turns off. It flashes when commands from software are received. This LED is used to identify the target server among multiple servers installed in a rack. Especially when performing maintenance from behind the server, lighting the LED will help you to identify which server to work with.

Tips

You can turn on an LED using remote management software.

4.7.7 LED on a hard disk drive

DISK LED on a hard disk drive indicates several states.



- **The LED flashes green**

This indicates a hard disk drive is being accessed.

- **The LED flashes amber**

When Logical Drives are configured in the RAID System, this indicates the installed hard disk drive is broken.

Tips

When Logical Drives (RAID 1, 5, 6, 10, 50 and 60) are configured in the RAID System, the system can continue to operate even if one hard disk drive (2 drives in the case of RAID 6 or RAID 60) failed. However, we recommend you replace the failed hard disk drive and perform rebuilding as soon as possible (hard disk drives are replaced by using hot swapping).

- **The LED flashes green and amber alternately**

This indicates that a hard disk drive is being rebuilt (not a defect). In a RAID System, the hard disk drive is automatically rebuilt upon replacing a broken hard disk drive (auto build function). The LED flashes green and amber alternately while a hard disk drive is being rebuilt.

The LED goes off when rebuilding completes. If rebuilding fails, the LED flashes amber.

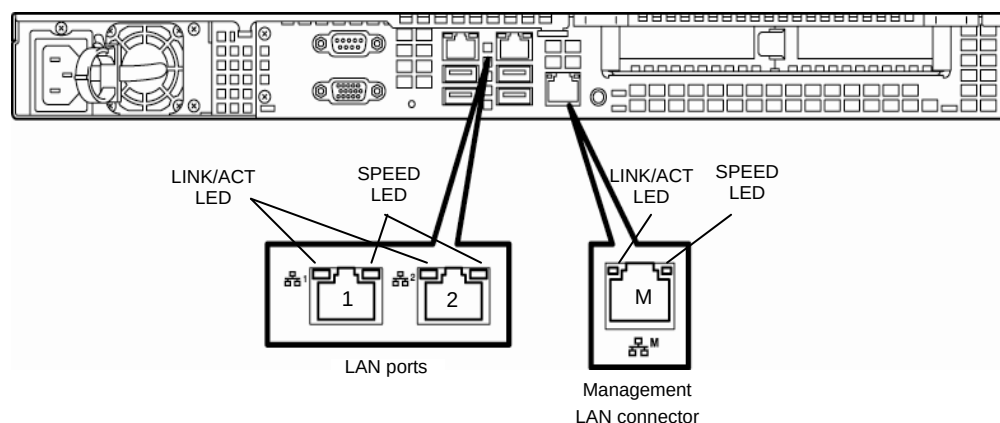
Important

Observe the following precautions whenever you use the auto build function.

- Do not turn off or reboot the server while a hard disk drive is being rebuilt.
- Wait at least 90 seconds before installing a hard disk drive after removing one.
- Do not replace a hard disk drive while another hard disk drive is being rebuilt.

4.7.8 LEDs for LAN connectors

The three LAN connectors provided at the rear of the server have two LEDs each.



- **LINK/ACT LED**

This LED indicates the state of the standard LAN connector. The LINK LED lights green when the server and hub are powered and properly connected. The ACT LED flashes green when the LAN connector is transmitting or receiving data.

If the LED does not turn on in LINK state, check the cable or connection.

- **SPEED LED**

This LED indicates which network interface is used.

- The two LAN connectors for data transmission support 1000BASE-T, 100BASE-TX, and 10BASE-T.

The LED indicates which network interface is being used.

- Amber: Operating with 1000BASE-T
 - Green: Operating with 100BASE-TX
 - OFF: Operating with 10BASE-T
- Management LAN connector supports 100BASE-TX and the LED flashes green during the operation.

Preparations

This chapter describes preparations for using this server.

1. Installing Internal Optional Devices

You can skip this section if you did not purchase any optional devices.

2. Installation and Connection

You must place the server in an appropriate location and connect cables following this section.

1. Installing Internal Optional Devices

This section describes the instructions for installing supported optional devices and precautions. If you did not purchase any optional device requiring installation, you may skip this section.

Important

- We recommend that optional devices be installed by a maintenance service staff from your maintenance service company, who has specialized knowledge of this server.
- Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.

1.1 Safety Precautions

Be sure to observe the following precautions to install and remove optional devices properly and safely.

 **WARNING**










Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions in Precautions for Use*.

- Do not disassemble, repair, or modify the server.
- Do not remove the lithium battery, NiMH battery, or Li-ion battery.
- Disconnect the power plug when installing and removing devices.

 **CAUTION**







Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions in Precautions for Use*.

- Do not drop
- Do not leave the server being pulled out.
- Make sure to complete installation.
- Do not install with the cover removed.
- Do not get your fingers caught.
- High temperature
- Electrical shock

1.2 Anti-static Measures

This product contains static-sensitive electronic components. Follow the measures below to avoid a failure caused by static electricity when installing or uninstalling any optional device.

- **Wearing Anti-static Wrist Strap Or Anti-static Gloves**

Wear a wrist strap on your wrist and connect the wire to the chassis. If there is no wrist strap, touch an unpainted metal surface of the chassis connected to the ground to discharge static electricity from your body before touching the component. Touch the metal part occasionally to discharge the static electricity while working on the component.

- **Checking the Workplace**

- Work on an anti-static floor or concrete floor.
- If you work on a place where static electricity is likely to be generated (e.g. carpet), be sure to provide anti-static protection.

- **Using the Work Table**

Place the server on a mat with Electrostatic Discharge (ESD) protection.

- **Clothing**

- Do not wear wool or synthetic clothes.
- Wear anti-static shoes.
- Remove any kind of metal accessories such as a ring, bracelet or wrist watch.

- **Handling of Components**

- Keep the component in an anti-static bag until you install it to the server.
- Hold the component by the edges to avoid touching any terminals or mounting parts.
- Place the component in an anti-static bag when storing or moving them.

- **Handling of Cables**

When connecting a cable (e.g., LAN cable), static electricity may also be charged due to friction against the floor.

Connecting the charged cable with an I/O device may cause damage to the devices in the system. It is recommended to use a product such as electrostatic discharge kit to eliminate the static charge before connecting the cable.

- **Installing and Uninstalling the Optional Device**

- To avoid electric hazard and malfunction, be sure to turn off the power switch of the server and unplug the power cord from the outlet before installing or uninstalling any optional device. If the device is hot-swappable, you do not need to turn off the power switch and unplug the power cord.
- The device contains static-sensitive electronic components. When installing or uninstalling the optional device, wear an anti-static wrist strap on your wrist to avoid a failure caused by the static electricity. To use the strap, connect the wire to the chassis.

1.3 Overview of Installation and Removal

Install/remove components by using the following procedure.

Installing/removing internal components except for Hard Disk Drives should be done after dismounting the server from the rack. It is recommended that more than one person removes the server from the rack.

⚠ CAUTION	
	Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to <i>Safety precautions in Precautions for Use</i>. • Do not drop the server • Do not leave the server pulled out of the rack • Replace the cover after installing components • Beware of high temperatures • Do not get your fingers caught when installing components

1. If the server is mounted on a rack, use the UID switch to identify the target server.
Refer to *Chapter 2 (1.4 Confirming Servers (UID Switch))*.
2. Remove the front bezel if applicable.
Refer to *Chapter 2 (1.5 Removing the Front Bezel)*.
3. If the server is ON, turn it off.
Refer to *Chapter 3 (6. Turning off the Server)*.
4. Disconnect the power cord from the outlet and the server.

Important

After disconnecting the power cord from the server, wait for at least 5 seconds before continuing to work because the components on the motherboard might still be operating for 3 to 4 seconds even after the power cord was disconnected.

5. When installing or removing the Internal Flash Memory, DIMMs, RAID Controllers, PCI cards, or optical disk drives, dismount the server from the rack and place it on a flat and hard desk.
Refer to *Chapter 2 (2.1.2 Installing the server to the rack or removing it from the rack – (2) Removal procedure)*.
If installing only an additional hard disk drive, go to step 11.

Important

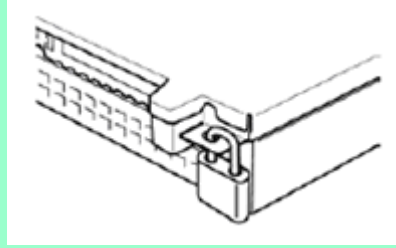
Do not leave the server open on the rack.

6. Remove the top cover.
Refer to *Chapter 2 (1.6. Removing the Top Cover)*.

Note

Chassis lock tab:

If the top cover is locked as shown in the figure below, remove the padlock.



7. Depending on the components to be installed or removed, follow the procedure in order.
Refer to *Chapter 2 (1.7 Internal Flash Memory to 1.13 Optical Disk Drive)*.
8. Connect cables.
Refer to *Chapter 2 (1.10.1 Connecting cables)*.
9. Attach the top cover.
Refer to *Chapter 2 (1.19 Attaching the Top Cover)*.
10. Mount the server onto the rack.
Refer to *Chapter 2 (2.1.2 (1) Installation)*.
11. Install Hard Disk Drives.
Refer to *Chapter 2 (1.15 3.5-inch Hard Disk Drive or 1.16 2.5-inch Hard Disk Drive)*.
12. Attach the front bezel.
Refer to *Chapter 2 (1.20 Attaching the Front Bezel)*.

This is the end of the installation or removal procedures for internal optional devices.

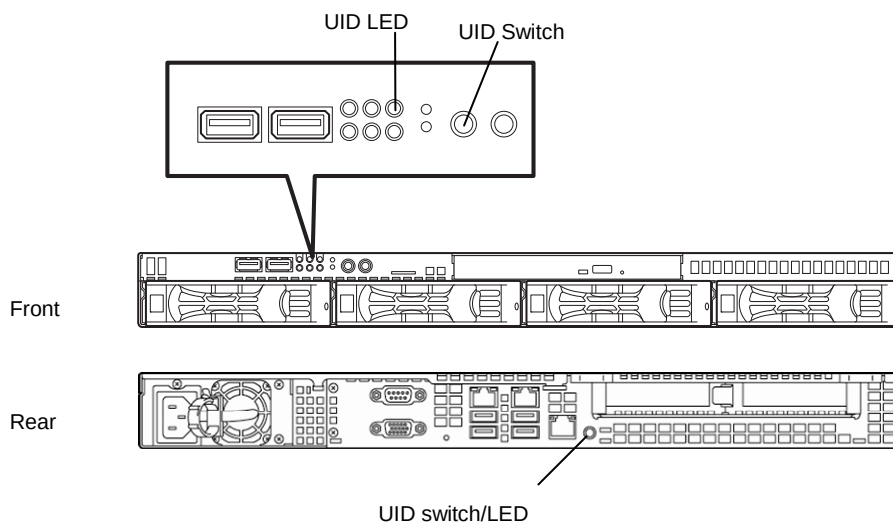
Continue the setup with reference to *Chapter 2 (2.2 Connection)*.

1.4 Confirming Servers (UID Switch)

Using the UID switch helps you to identify the target server.

When the server is working or before you turn the server off or disconnect a cable from the server, **be sure to identify the target server by using the UID switch first.**

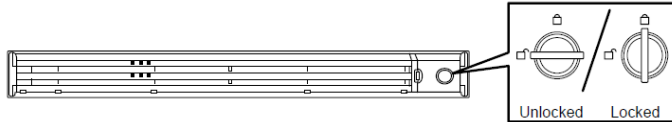
If UID (Unit ID) switch is pressed, UID LED will be on or flash. If it is pressed again, the LED will be off.



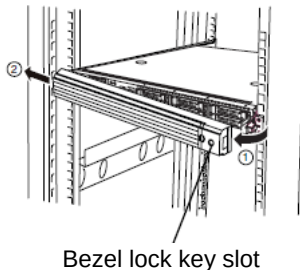
1.5 Removing the Front Bezel

If the server is mounted on a rack, the front bezel needs to be removed when turning the server on or off, or handling an optical disk drive.

1. Insert the attached bezel lock key into the key slot and turn the key to the front bezel side while pressing it lightly to release the lock.



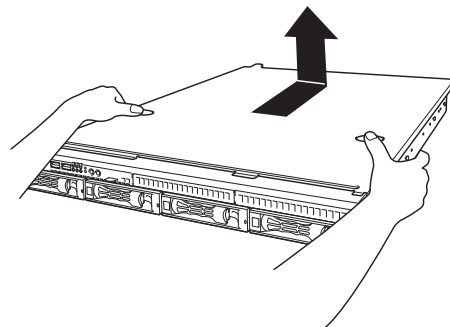
2. Hold the right end of the front bezel carefully to pull it toward you.
3. Slide the front bezel to the left a little to release the tab from the frame and then remove the front bezel from the server. (The example image shown is for a 2.5-inch drive model.)



1.6 Removing the Top Cover

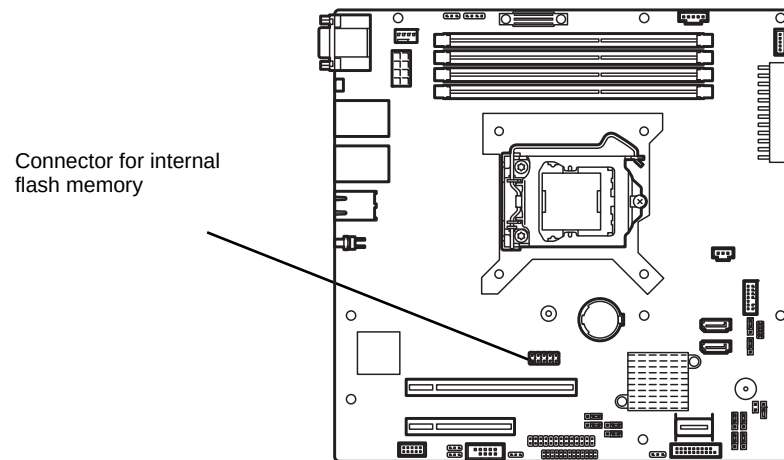
Remove the top cover when installing or removing the Internal optional drives connections.

1. Slide back the top cover while pressing its release button.
2. Lift the top cover off the server.



1.7 Internal Flash Memory

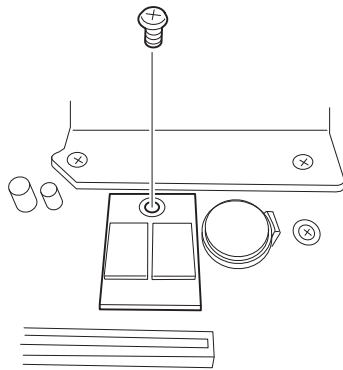
This section describes the procedure for installing the Internal Flash Memory.



1.7.1 Installation

Install the Internal Flash Memory in the following procedure.

1. Refer to steps 1 to 4 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Attach the Internal Flash Memory and fix it with the screw provided with this product.



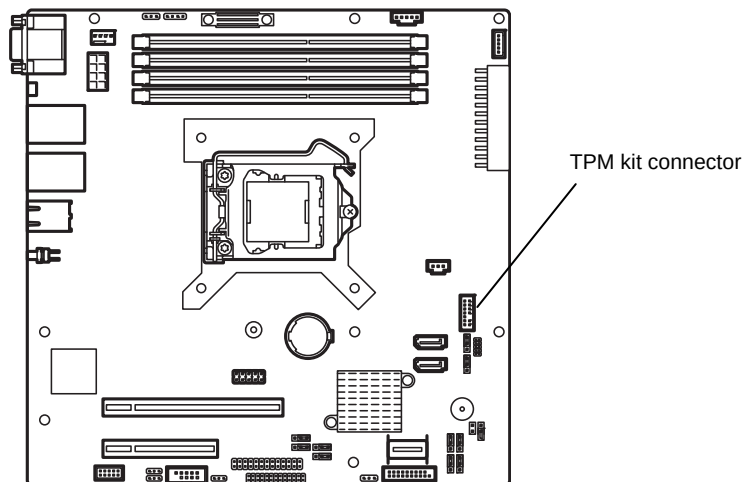
3. Attach the cover provided with this product to the Internal Flash Memory.

1.7.2 Removal

To remove the Internal Flash Memory, reverse the installation procedure.

1.8 TPM Kit

This section describes the procedure for installing optional TPM Kit.



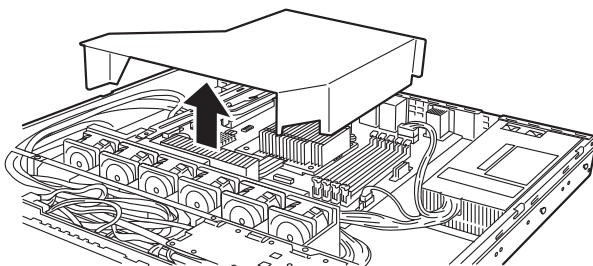
1.8.1 Installation

Install the TPM Kit in accordance with the following procedure.

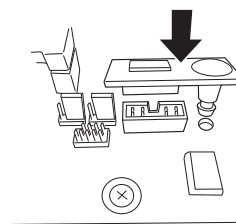
Note

The TPM kit once installed cannot be removed.

1. Refer to steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Lift the air duct and remove it.



3. Install the TPM Kit and secure it by pushing the nylon rivet provided with the TPM Kit.



1.9 DIMM

Install a DIMM (Dual Inline Memory Module) to a DIMM socket on the motherboard in the server. The motherboard provides four sockets to install DIMMs.

Important

- You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.
- Use only the specified DIMMs. Installing a DIMM from a third party may damage not only the DIMM but the motherboard. You will be charged to repair failures or damages caused by the use of such products even within the warranty period.

Tips

Up to 32 GB (8 GB × 4) of memory can be installed.

The server supports 2-way interleaved memory system.

In 2-way interleaved memory system, the data transfer rate of the memory is twice that of a non-interleaved memory system.

1.9.1 Maximum supported memory size

The maximum available memory size on the server depends on the architecture (x86 architecture) and OS specs.

A list of maximum memory sizes

OS	The maximum memory size supported on each OS	The maximum memory size supported on the server
Windows Server 2008 Standard x86 Edition	4 GB	4 GB (If using HW-DEP function) * Default factory settings About 3.5 GB (If not using HW-DEP function) Note: When Execute Disable Bit (XD Bit) is set to Disabled in BIOS SETUP.
Windows Server 2008 R2 Standard	32 GB	32 GB
Windows Server 2008 Enterprise	64 GB	
Windows Server 2008 R2 Enterprise	2 TB	
Windows Server 2012 Standard Windows Server 2012 Datacenter	4 TB	
Red Hat Enterprise Linux 5 Red Hat Enterprise Linux 6	16 GB	16 GB
Red Hat Enterprise Linux 5 (EM64T)	1 TB	32 GB
Red Hat Enterprise Linux 6 (x86_64)	3 TB	
VMware ESXi 5.1	2 TB	32 GB Up to 1 TB of the main memory is available to each virtual machine.

1.9.2 DIMM installation order

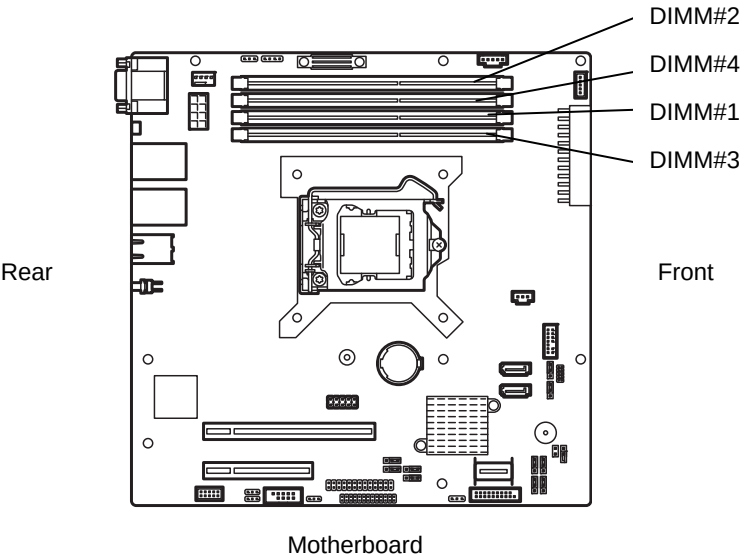
Install DIMMs one by one in order of increasing memory size into slots in the order of DIMM#1, DIMM#2, DIMM#3, and DIMM#4.

If you want to run the server in 2Way Interleave mode, observe the following when installing the DIMMs:

- Install them in pairs
- The two DIMMs installed together must be of the same specifications and memory size.
- Install the pairs as DIMM#1 and DIMM#2, or DIMM#3 and DIMM#4 (the installation order between the pairs does not matter.)

Installation examples

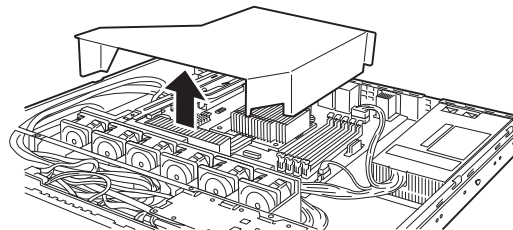
Example	2Way Interleave	DIMM#1	DIMM#2	DIMM#3	DIMM#4
1	Runs	2 GB DIMM	2 GB DIMM	Not installed	Not installed
2	Runs	2 GB DIMM	2 GB DIMM	2 GB DIMM	2 GB DIMM
3	Does not run	2 GB DIMM	2 GB DIMM	2 GB DIMM	Not installed
4	Does not run	2 GB DIMM	2 GB DIMM	Not installed	2 GB DIMM



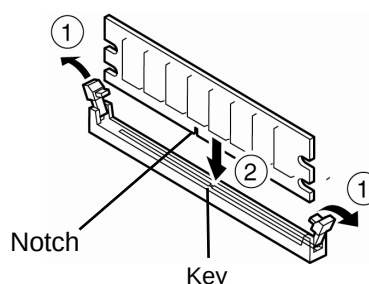
1.9.3 Installation

Install a DIMM by using the following procedure.

1. Refer to steps 1 to 4 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Lift the duct off the server.



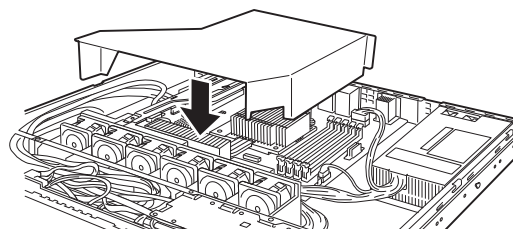
3. Rotate both levers outward and push the DIMM straight into the socket. When a DIMM is inserted into the socket, the lever automatically closes.



Important

- Align the notch on the DIMM with the key on the slot.
- Do not apply too much pressure when you push a DIMM into the socket. Doing so can damage the socket or terminal part.

4. Attach the duct.



5. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
6. Confirm that no error messages are displayed in POST screen.
If any error messages are displayed, refer to *Chapter 3 (1. POST Error Message)* in "Maintenance Guide".
7. Run the SETUP utility, and select **Memory Configuration** and then **Memory Information** from the **Advanced** menu. Make sure the capacity of added DIMM is displayed properly.
Refer to *Chapter 2 (1. System BIOS)* in "Maintenance Guide".
8. Select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**.
After that, select **Save Changes and Exit** to reboot.
9. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "Installation Guide (Windows)".
For other OS, consult the manual provided with the operation system or contact the store where you purchased it or your maintenance service company.

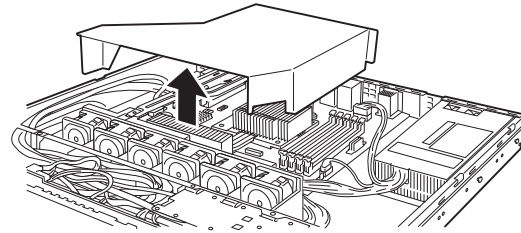
1.9.4 Removal

Remove a DIMM in the following procedure.

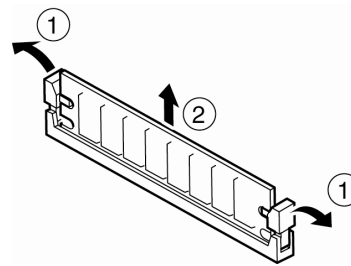
Note

- When removing a defective DIMM, check error messages displayed at POST or NEC ESMPRO and check the DIMM socket where the defective DIMM is installed.
- At least one DIMM needs to be installed for the server to operate.

1. Refer to steps 1 to 4 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Lift the duct off the server.



3. Open levers on left and right sides of DIMM slot to unlock DIMM.
4. Remove DIMM by pulling it up straight.



5. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
6. Confirm that no error messages are displayed on POST. If any error message is displayed, refer to *Chapter 3 (1. Post Error Message)* in "Maintenance Guide".
7. Run the SETUP utility, select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**. After that, select **Save Changes and Exit** to reboot.
8. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "Installation Guide (Windows)".
For other OS, consult the manual provided with the operation system or contact the store where you purchased it or your maintenance service company.

1.10 Jumper Settings and Cable Connections Based on Internal Hard Disk Drive Configuration

This section describes the jumper settings and cable connections when using hard disk drives installed in HDD cages in a non-RAID System or RAID System.

Important If you use Hard Disk Drives in the RAID System or change the RAID level, initialize the Hard Disk Drives. If the Hard Disk Drive contains valuable data, be sure to backup the Hard Disk Drive before installing the RAID Controller and configuring the RAID System.

Note In the RAID System, use Hard Disk Drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.

Tips Logical Drives can be created even with only one Physical Device.

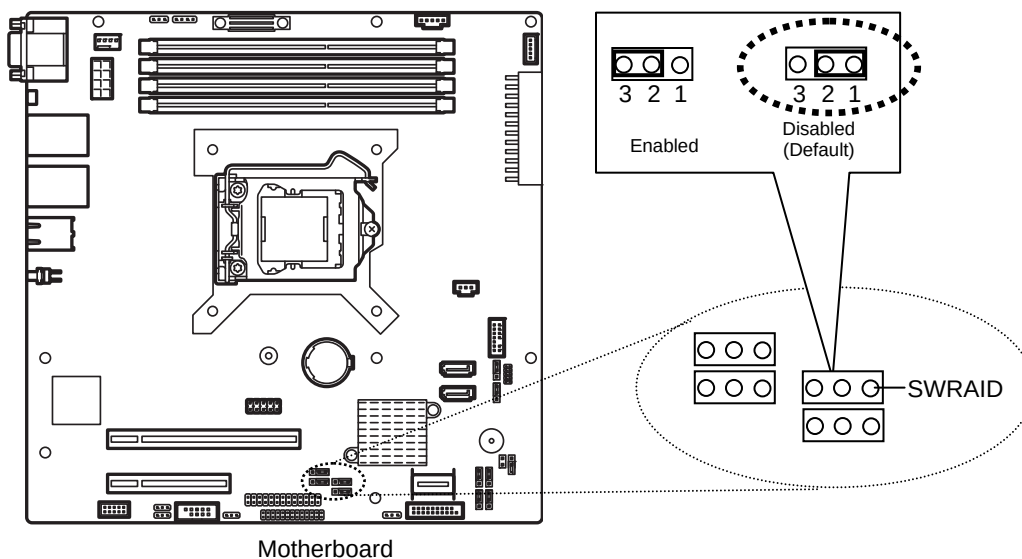
Set the jumper on the motherboard according to your system, as shown below.

Important You must avoid static electricity to work with the procedure below. For details, refer to *Chapter 2 (1.2 Anti-static Measures)*.

(a) When using on-board SATA Controllers (LSI Embedded MegaRAID™)

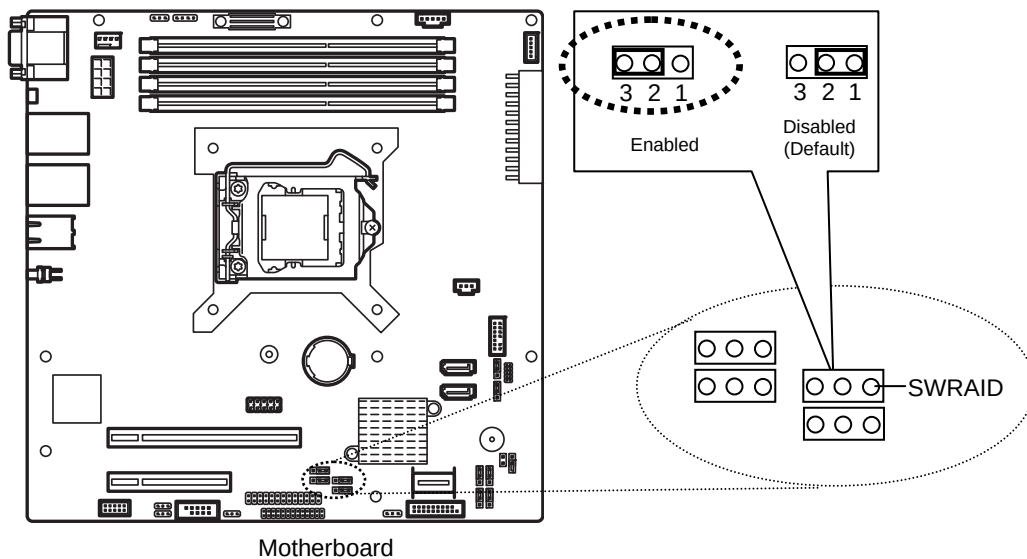
Jumper on motherboard (SWRAID)

The SWRAID jumper is set to "non-RAID" in the factory.



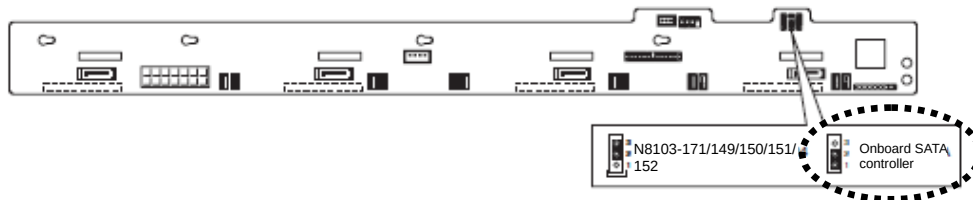
When configuring a RAID System by using the on-board SATA controller, change the setting of the RAID configuration jumper.

Jumper on motherboard (SWRAID)

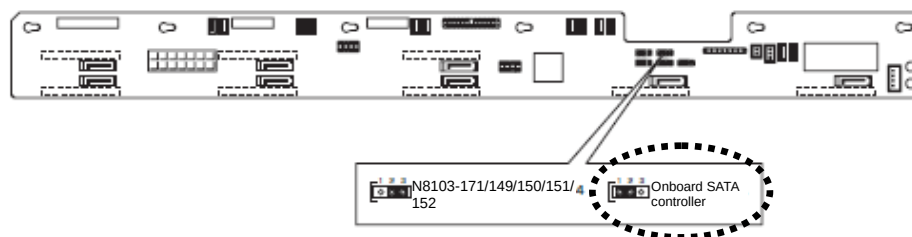


See the figure below for the location of the jumper on the backplane for the hard disk drive when using the on-board SATA controller.

Backplane for 3.5-inch Hard Disk Drive (J3)



Backplane for 2.5-inch Hard Disk Drive (J3)



After that, configure the RAID System by using the LSI Software RAID Configuration utility.

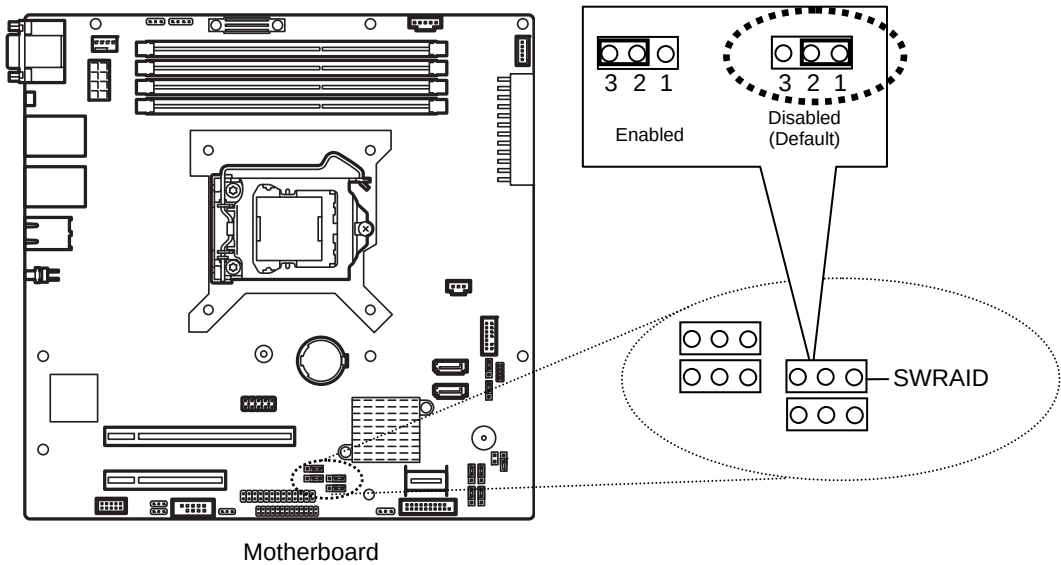
For details, refer to *Chapter 2 (4. RAID System Configuration)* in "Maintenance Guide".

Tips

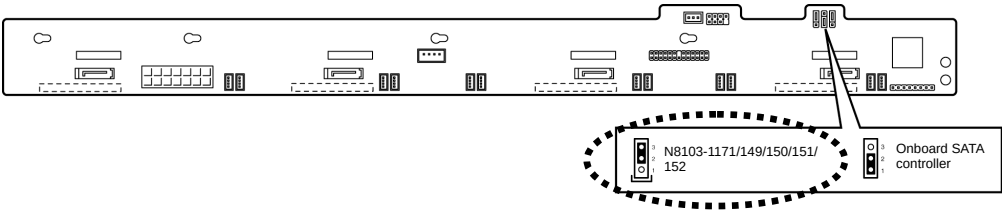
If you setup using the attached EXPRESS BUILDER DVD, the RAID System can be automatically created.

(b) If an optional RAID Controller (N8103-171/149/150/151/152) is used

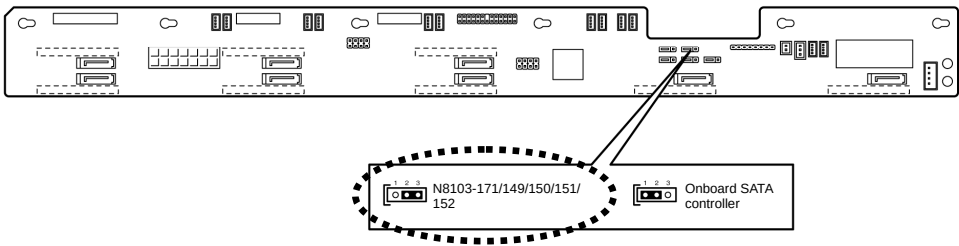
Jumper on motherboard (SWRAID)



Backplane for 3.5-inch Hard Disk Drive (J3)



Backplane for 2.5-inch Hard Disk Drive (J3)



Note When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot xx ROM** (xx is PCI slot number) is set to **Enabled**.

Important Do not change the mode to hibernate when building a RAID System.

(c) Installation

For the instruction of installing the optional RAID Controller (N8103-171/149/150/151/152), refer to *Chapter 2 (1.12 PCI Card)*.

Important

When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.

(d) Removal

To remove the optional RAID Controller (N8103-171/149/150/151/152), reverse the installation procedure.

If you intend to use with the card removed, be sure to attach the slot cover attached to the riser card. The slot cover must be screwed into place.

1.10.1 Connecting cables

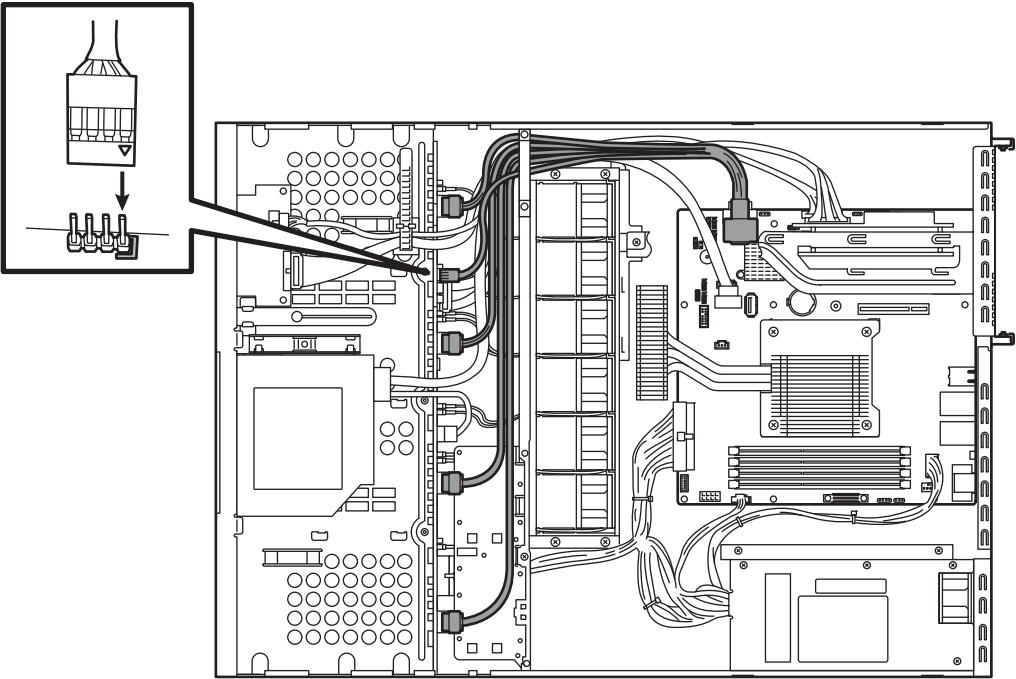
To use an on-board RAID Controller or optional RAID Controller, the interface cable must be connected. Refer to the figures below for how to connect cables.

Important Both SAS Hard Disk Drives and SATA Hard Disk Drives cannot be installed.

Tips When using SAS Hard Disk Drives, RAID Controllers must be connected.

If using the on-board RAID Controller for a 3.5-inch drive model

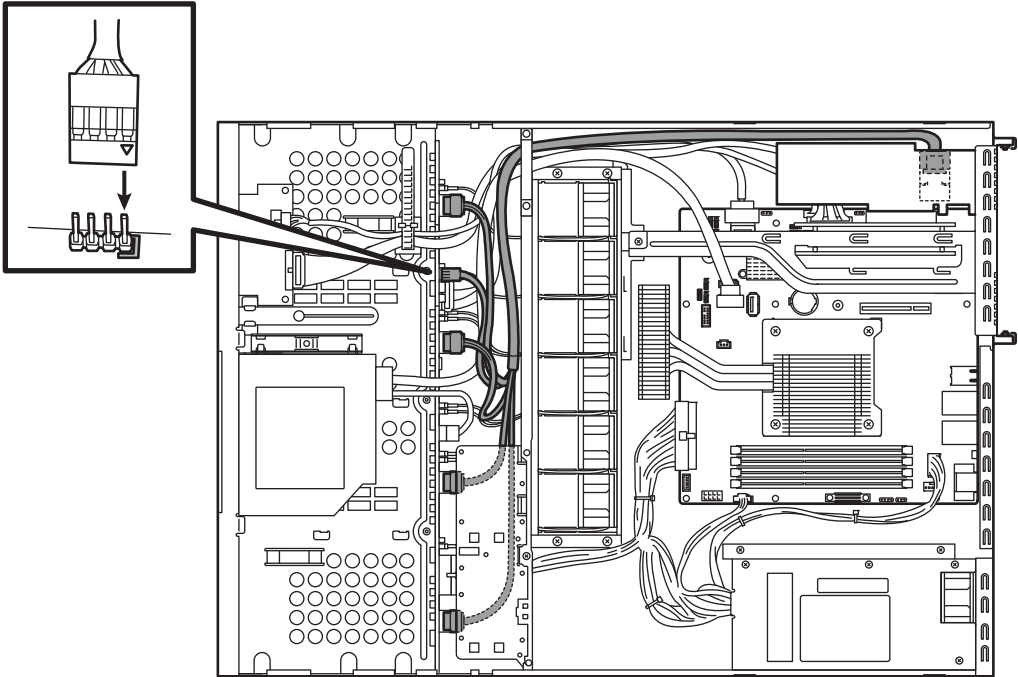
- You need to prepare the internal SAS/SATA cable K410-288(00), which is separately available.
- Connect the P0 to P3 connectors of the internal SAS/SATA cable K410-288(00) to the SATA0 to SATA3 connectors on the backplane, respectively.
- Connect pin 1 (indicated by the triangle Δ) of the S1 connector of the internal SAS/SATA cable K410-288(00) to pin 1 (indicated by the bold line) of the SGPIO1 connector on the backplane.
- Connect the miniSAS connector of the internal SAS/SATA cable K410-288(00) to the MINISAS_1 connector on the motherboard.



Motherboard	Hard Disk Drive	Backplane
MINISAS_1	SLOT 0	SATA 0
	SLOT 1	SATA 1
	SLOT 2	SATA 2
	SLOT 3	SATA 3

If using optional RAID Controller for a 3.5-inch drive model

- You need to prepare the internal SAS/SATA cable K410-240(00), which is separately available.
- Connect the P0 to P3 connectors of the internal SAS/SATA cable K410-240(00) to the SATA0 to SATA3 connectors on the backplane, respectively.
- Connect pin 1 (indicated by the triangle Δ) of the S1 connector of the internal SAS/SATA cable K410-240(00) to pin 1 (indicated by the bold line) of the SGPIO1 connector on the backplane.
- Connect the miniSAS connector of the internal SAS/SATA cable K410-240(00) to the connectors for ports 0 to 3 on the optional RAID Controller.

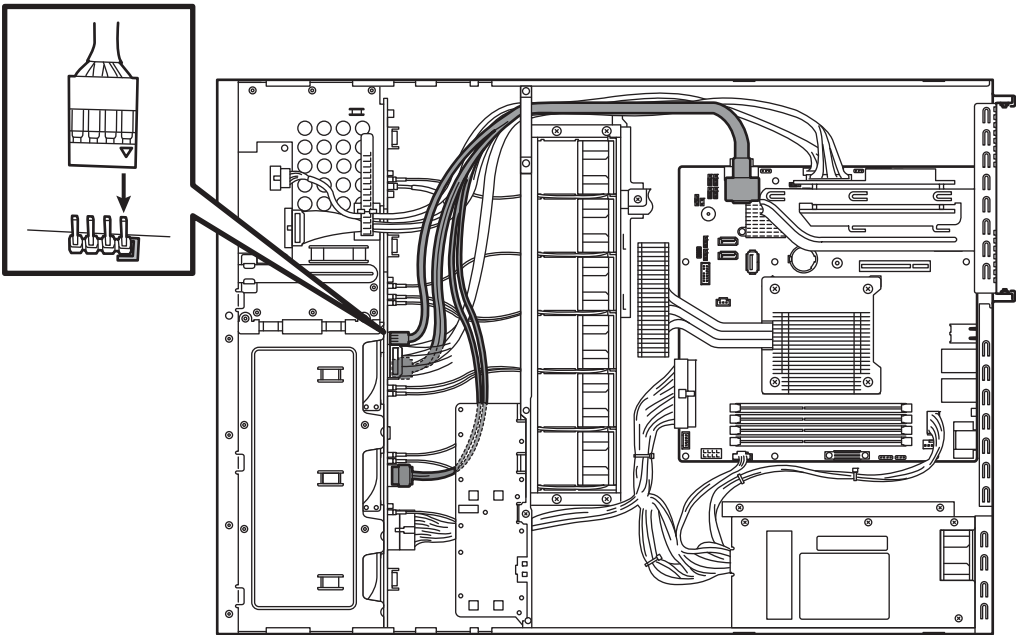


Optional RAID Controller	Hard Disk Drive	Backplane
Ports 0 to 3	SLOT 0	SATA 0
	SLOT 1	SATA 1
	SLOT 2	SATA 2
	SLOT 3	SATA 3

In the 2.5-inch drive model, where to connect on the backplane differs depending on the number of hard disk drives installed (6 or 8). See the description below for the backplane number and the slot number on the hard disk drive.

If using the on-board SATA controller in a 2.5-inch drive model with six hard disk drives installed (1 to 4 drives)

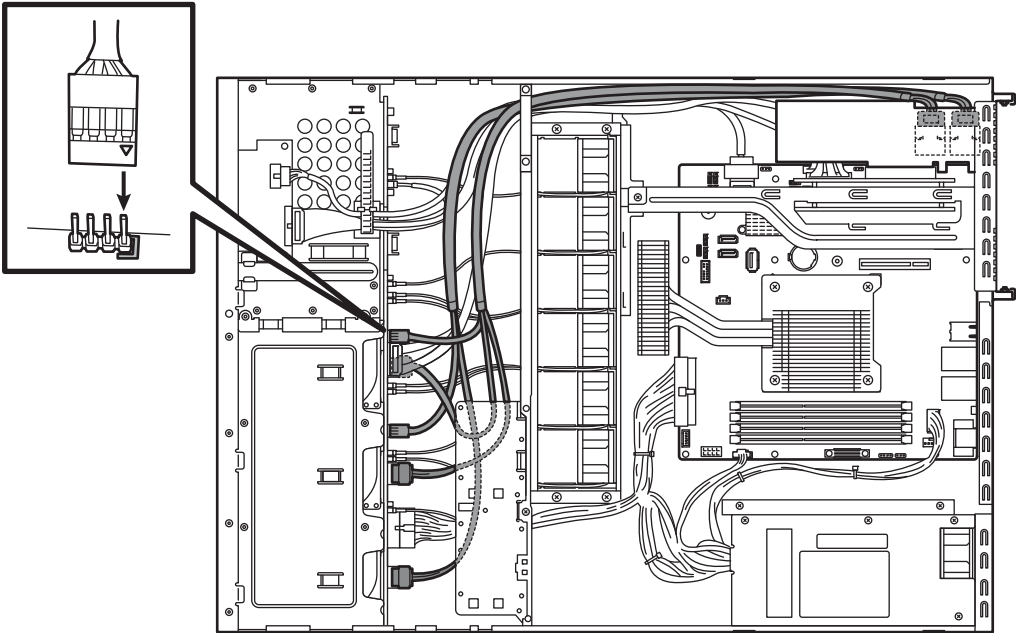
- You need to prepare the internal SAS/SATA cable K410-289(00), which is separately available.
- Connect the P0 to P3 connectors of the internal SAS/SATA cable K410-289(00) to the SATA2 to SATA5 connectors on the backplane, respectively.
- Connect pin 1 (indicated by the triangle Δ) of the S1 connector of the internal SAS/SATA cable K410-289(00) to pin 1 (indicated by the bold line) of the SGPIO1 connector on the backplane.
- Connect the miniSAS connector of the internal SAS/SATA cable K410-289(00) to the MINISAS_1 connector on the motherboard.



Motherboard	Hard Disk Drive	Backplane
MINISAS_1	SLOT 0	SATA 2
	SLOT 1	SATA 3
	SLOT 2	SATA 4
	SLOT 3	SATA 5

If using optional RAID Controller for a 2.5-inch drive model with six hard disk drives installed (1 to 6 drives)

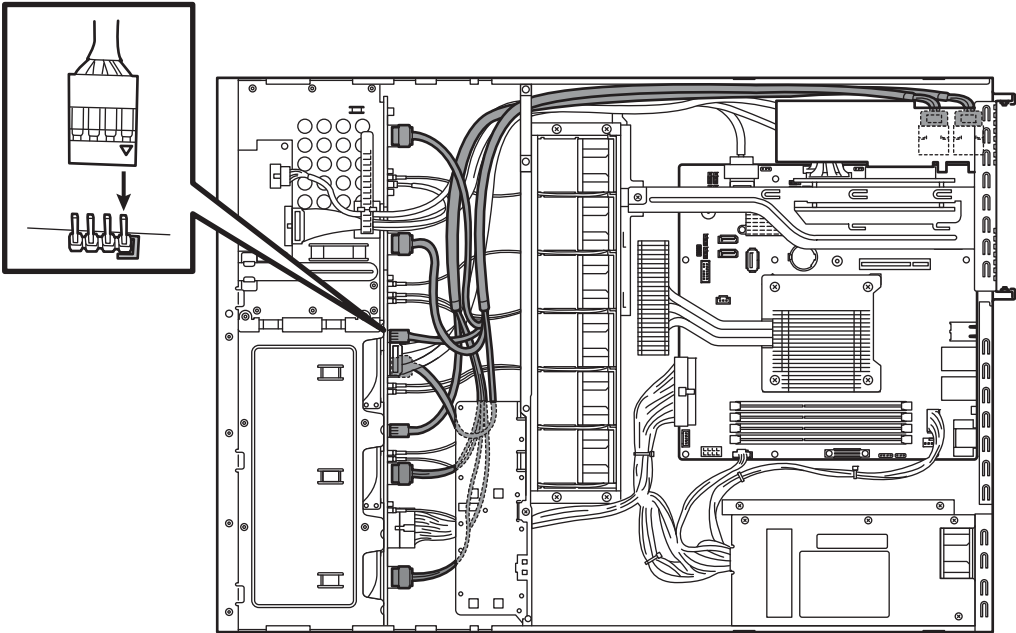
- You need to prepare the internal SAS/SATA cables K410-240(00) and K410-204(00), which are separately available.
- Connect the P0 to P3 connectors of the internal SAS/SATA cable K410-240(00) to the SATA2 to SATA5 connectors on the backplane, respectively.
- Connect the P4 and P5 connectors of the internal SAS/SATA cable K410-204(00) to the SATA6 and SATA7 connectors on the backplane, respectively.
- Connect pin 1 (indicated by the triangle Δ) of the S1 connector of the internal SAS/SATA cable K410-240(00) to pin 1 (indicated by the bold line) of the SGPIO1 connector on the backplane.
- Connect pin 1 (indicated by the triangle Δ) of the S2 connector of the internal SAS/SATA cable K410-204(00) to pin 1 (indicated by the bold line) of the SGPIO2 connector on the backplane.
- Connect the miniSAS connector of the internal SAS/SATA cable K410-240(00) to the connectors for ports 0 to 3 on the optional RAID Controller.
- Connect the miniSAS connector of the internal SAS/SATA cable K410-204(00) to the connectors for ports 4 to 7 on the optional RAID Controller.



Optional RAID Controller	Hard Disk Drive	Backplane
Ports 0 to 3	SLOT 0	SATA 2
	SLOT 1	SATA 3
	SLOT 2	SATA 4
	SLOT 3	SATA 5
Ports 4 to 7	SLOT 4	SATA 6
	SLOT 5	SATA 7
	—	—
	—	—

If using optional RAID Controller for a 2.5-inch drive model with eight hard disk drives installed (1 to 8 drives)

- You need to prepare the internal SAS/SATA cables K410-240(00) and K410-204(00), which are separately available.
- Connect the P0 to P3 connectors of the internal SAS/SATA cable K410-240(00) to the SATA0 to SATA3 connectors on the backplane, respectively.
- Connect the P4 to P7 connectors of the internal SAS/SATA cable K410-204(00) to the SATA4 to SATA7 connectors on the backplane, respectively.
- Connect pin 1 (indicated by the triangle Δ) of the S1 connector of the internal SAS/SATA cable K410-240(00) to pin 1 (indicated by the bold line) of the SGPIO1 connector on the backplane.
- Connect pin 1 (indicated by the triangle Δ) of the S2 connector of the internal SAS/SATA cable K410-204(00) to pin 1 (indicated by the bold line) of the SGPIO2 connector on the backplane.
- Connect the miniSAS connector of the internal SAS/SATA cable K410-240(00) to the connectors for ports 0 to 3 on the optional RAID Controller.
- Connect the miniSAS connector of the internal SAS/SATA cable K410-204(00) to the connectors for ports 4 to 7 on the optional RAID Controller.



Optional RAID Controller	Hard Disk Drive	Backplane
Ports 0 to 3	SLOT 0	SATA 0
	SLOT 1	SATA 1
	SLOT 2	SATA 2
	SLOT 3	SATA 3
Ports 4 to 7	SLOT 4	SATA 4
	SLOT 5	SATA 5
	SLOT 6	SATA 6
	SLOT 7	SATA 7

1.10.2 Notes on setting up a RAID System

Note the following points when setting up a RAID System.

- The number of Hard Disk Drives required varies in each RAID level.
- If on-board RAID Controllers or the optional RAID Controllers (N8103-171/149) are used, the RAID System cannot be built in RAID5/RAID6.

RAID level	The minimum number of Hard Disk Drives required to set up a RAID System	
	On-board RAID Controller or N8103-171/149	N8103-150/151/152/160
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3
RAID 10	4	4
RAID 50		6
RAID 60		6

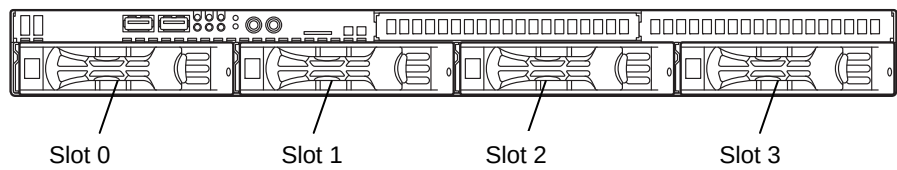
- Use SAS/SATA Hard Disk Drives or SSDs that have the same capacity and rotational speed.
- If you intend to install the OS to the RAID System, the process from RAID configuration to OS installation can be easily completed by using the EXPRESSBUILDER. If you wish to install the OS manually, use a RAID System Configuration utility (WebBIOS or SuperBuild utility). The utility can be run during POST which starts immediately after the server is turned on. For details on the procedure of configuring a Logical Drive, refer to *Chapter 2 (4. RAID System Configuration)* in "Maintenance Guide" or the manual supplied with the optional RAID Controller (N8103-171/149/150/151/152/160).

Important

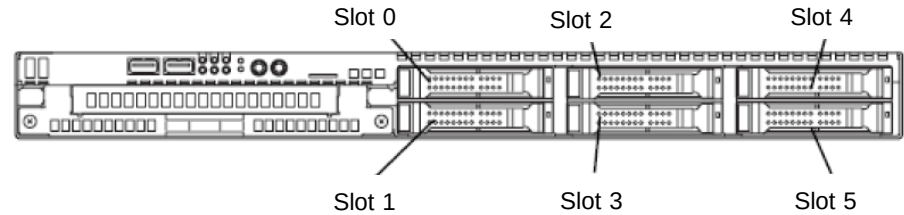
- Do not change the RAID System mode to hibernate.
- Build a Disk Array in the RAID System using Hard Disk Drives that have the same specifications (capacity, rotational speed, and standard).

The insert position number displayed on the server

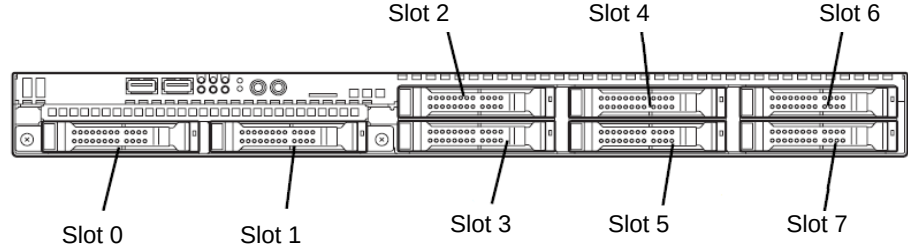
3.5-inch drive model



2.5-inch drive model (1 to 6 drives)



2.5-inch drive model (1 to 8 drives)



1.1.1 Extra Battery for RAID Controller

If a RAID Controller (N8103-171/149/150/151/152/160) is installed, use the optional extra battery or flash backup unit to avoid data loss caused by accidents including temporary blackout during a Write Back operation. The model of the extra battery and flash backup unit to be used depends on RAID Controller.

- For N8103-149/150/151, use N8103-154 extra battery
- For N8103-152, use flash backup unit that comes with N8103-152
- For N8103-160, use N8103-162 extra battery

1.1.1.1 Handling precautions

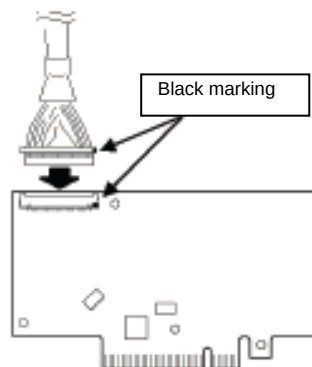
Below are the precautions to be observed whenever using the backup battery. Be sure to observe the following, otherwise property such as data or other devices might be destroyed.

- Use the extra battery that supports the RAID Controller used.
- The extra battery is a very delicate electronic device. Before installation, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the backup battery.
- For recycling and disposing the backup battery, refer to the user's guide that comes with it.

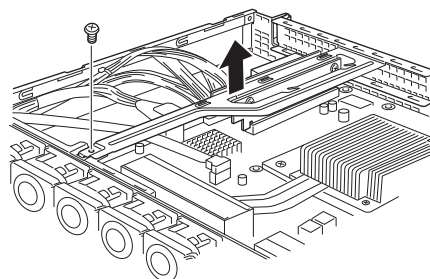
1.1.1.2 Installing N8103-154 extra battery (for N8103-149/150/151)

This section describes the procedure of installing an extra battery for RAID Controller.

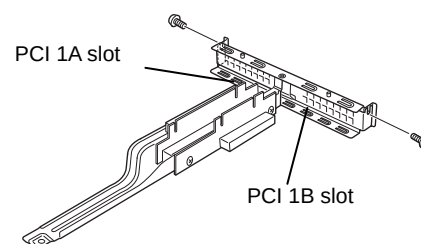
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Refer to *Chapter 2 (1.6 Removing the Top Cover)* to remove the top cover.
3. Remove the RAID Controller. Connect the battery control cable that comes with extra battery to RAID Controller. When connecting the cable, orient the cable so that its marking will fit the connector.



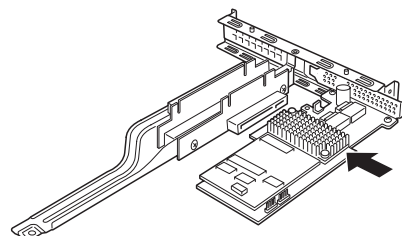
4. Remove a screw securing the riser card. Hold the both sides of the card and lift it straight off the server.



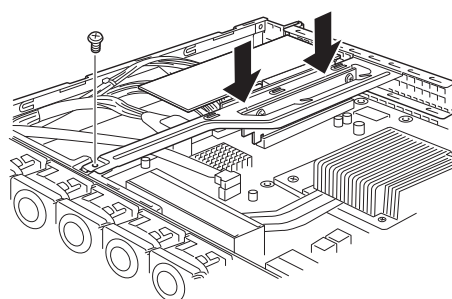
5. Remove a screw from the riser card and remove the PCI 1B blank cover.



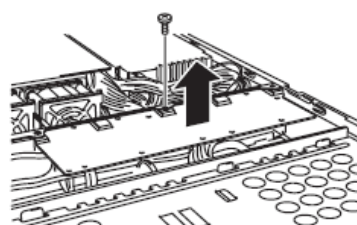
6. Attach the RAID Controller to the riser card.



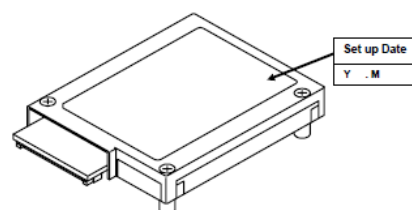
7. Insert the riser card into the slot of the motherboard and fix the riser card with the screw which you removed in step 5. Position the terminal part of the riser card in the slot of the motherboard and then securely insert it.



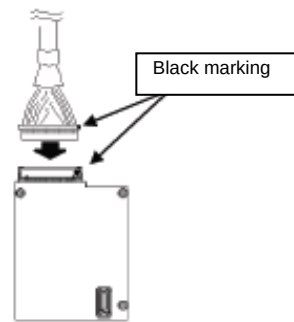
8. Unscrew the battery bracket securing the battery.



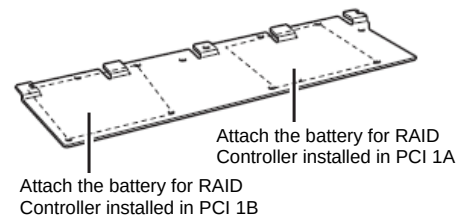
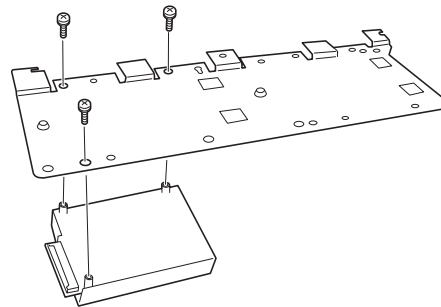
9. Write down the installation date (year and month) on the SET UP DATE LABEL and attach it to the position shown in the image on the right.



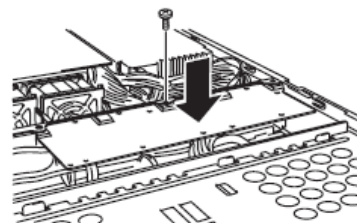
10. Connect a battery control cable to battery pack, as shown in the figure to the right. Pay attention to orientation of connector, and insert the connector straight and securely.



11. Attach the extra battery to the battery bracket by using three screws. The installation position of the extra battery is PCI 1B side.



12. Attach the bracket you removed in step 8 using the screw.

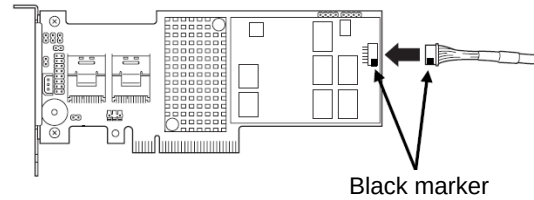


13. Attach the removed components.

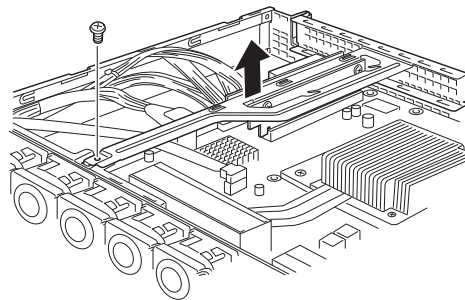
1.11.3 Installing flash backup unit that comes with N8103-152

This section describes the procedure of installing a flash backup unit that comes with N8103-152 RAID Controller.

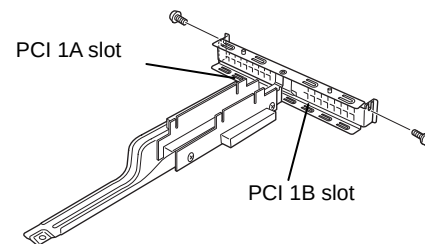
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Refer to *Chapter 2 (1.6 Removing the Top Cover)* to remove the top cover.
3. Connect FBU control cable (600 mm) that comes with the N8103-152 RAID Controller.



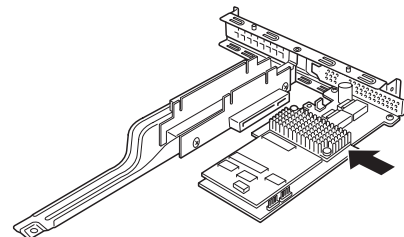
4. Remove the screw securing the riser card. Hold the both sides of the card and lift it straight off the server.



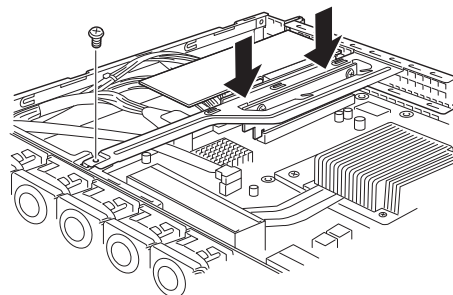
5. Remove the screw from the riser card and remove the PCI 1B blank cover.



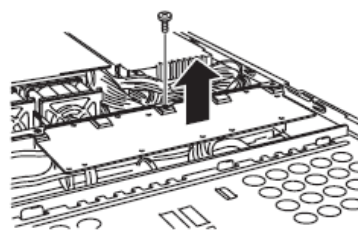
6. Attach the RAID Controller to the riser card.



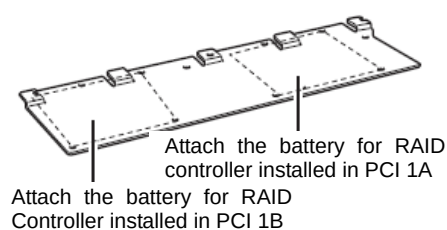
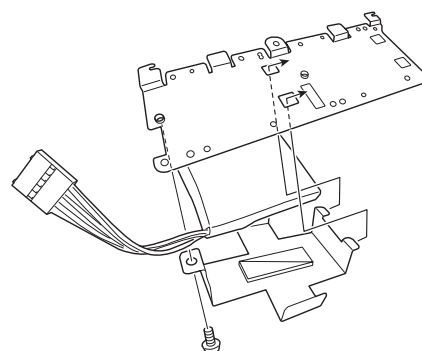
7. Insert the riser card into the slot of the motherboard and fix the riser card with the screw which you removed in step 4. Position the terminal part of the riser card in the slot of the motherboard and then securely insert it.



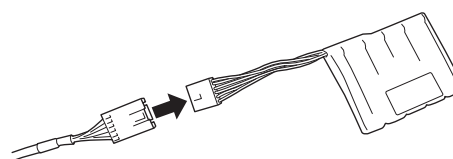
8. Unscrew the battery bracket securing the battery.



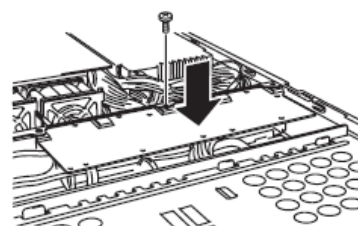
9. Attach the flash backup unit to the battery bracket by using one screw.
The installation position of the flash backup unit is the PCI 1B side.



10. Then, connect FBU control cable (600) to flash backup unit.



11. Attach the bracket you removed in step 8 using the screw.

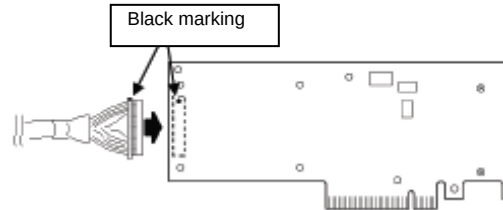


12. Attach the removed components.

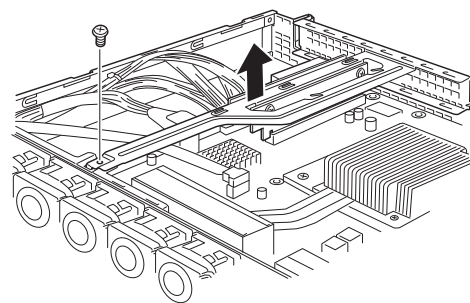
1.11.4 Installing N8103-162 extra battery (for N8103-160)

This section describes the procedure of installing an extra battery for RAID Controller.

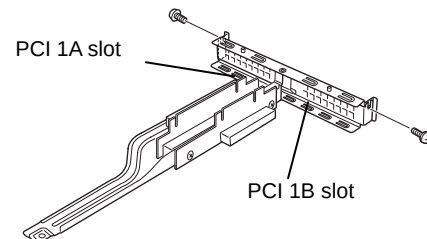
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Refer to *Chapter 2 (1.6 Removing the Top Cover)* to remove the top cover.
3. Remove the RAID Controller. Connect the battery control cable that comes with extra battery to RAID Controller. When connecting the cable, orient the cable so that its marking will fit the connector.



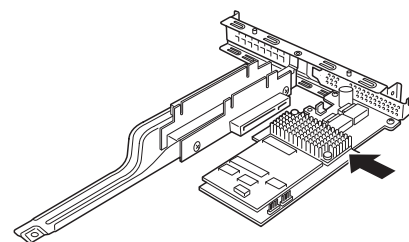
4. Remove the screw securing the riser card. Hold the both sides of the card and lift it straight off the server.



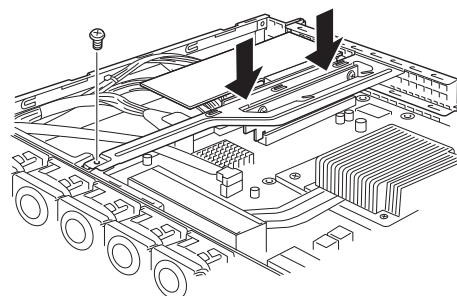
5. Remove the screw from the riser card and remove the blank cover of PCI slot which you install the RAID controller.



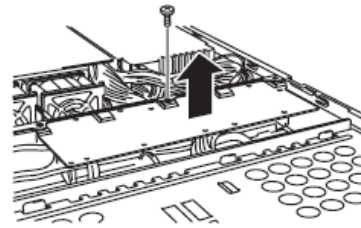
6. Attach the RAID Controller to the riser card.



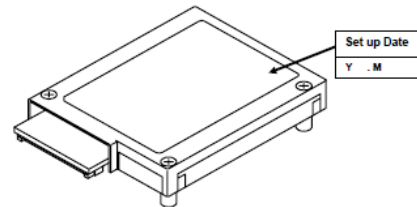
7. Insert the riser card into the slot of the motherboard and fix the riser card with one screw which you removed in step 4. Position the terminal part of the riser card in the slot of the motherboard and then securely insert it.



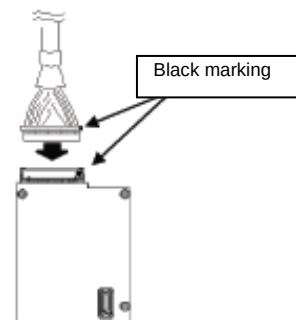
8. Unscrew the battery bracket securing the battery.



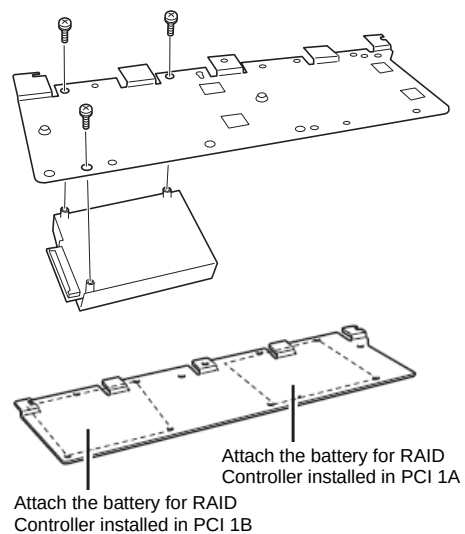
9. Write down the installation date (year and month) on the SET UP DATE LABEL and attach it to the position shown in the image on the right.



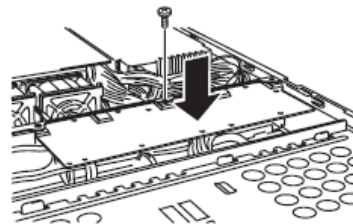
10. Using the image on the right as a reference, connect the battery control cable to the battery pack.
When connecting the cable, check the orientation of the connector and connect straight.



11. Attach the extra battery to the battery bracket by using three screws.
The installation position of the extra battery varies between PCI 1A and PCI 1B.



12. Attach the bracket using the screws you removed in step 8.



13. Attach the removed components.

***1.11.5* Removal**

For removing the extra battery for the RAID Controller, reverse the installation procedure.

1.12 PCI Card

The server provides a riser card where you can install a PCI card on the motherboard. The riser card can have two low-profile PCI cards installed.

Connect PCI cards for network expansion or file device function into PCI card slots provided on the riser card.

Important

PCI cards and the riser card are extremely sensitive to static electricity. Be sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI card terminals or parts with bare hand or place the PCI card directly on the desk. For detailed information on static electricity, refer to *Chapter 2 (1.2 Anti-static Measures)*.

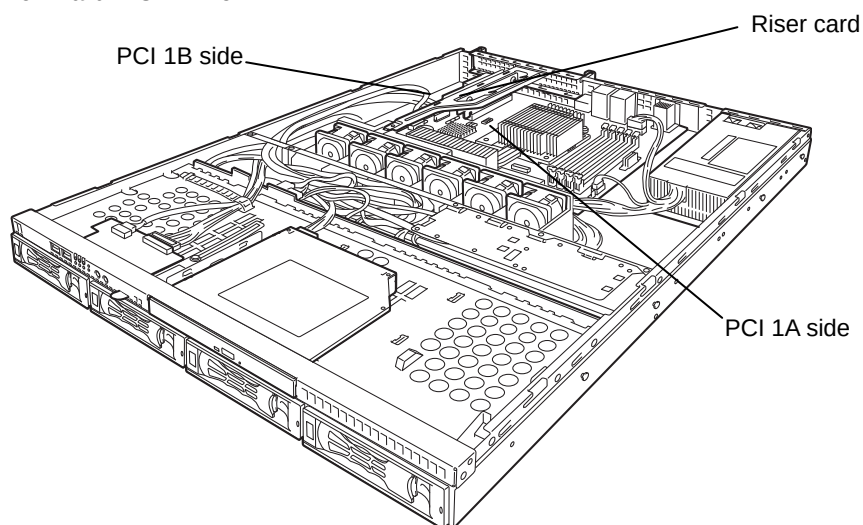
Note

- The combination of PCI cards to be installed is restricted. For details, refer to "System Configuration Guide".
- Only Low-profile type of PCI cards can be installed in the riser card of the server. Check the card spec before installation.

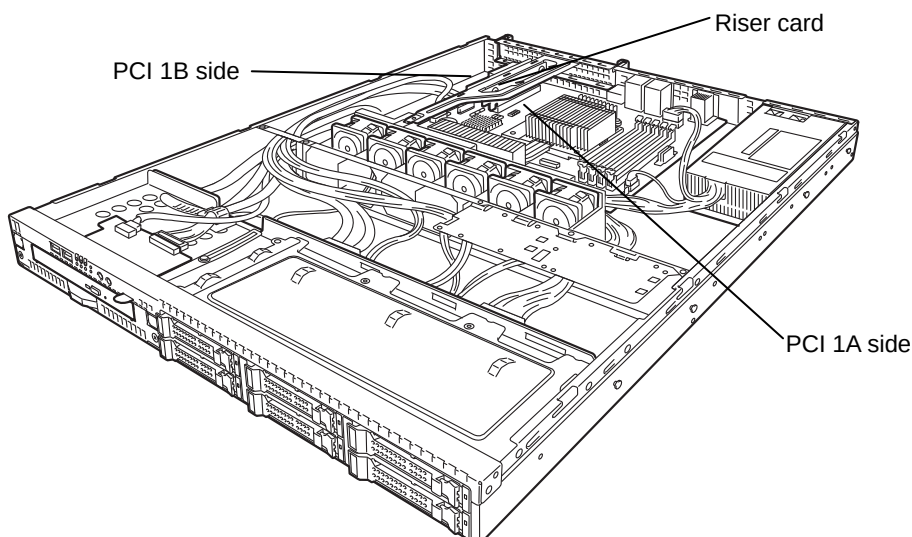
Tips

If SAS controllers, RAID Controllers, LAN cards (network boot), or Fibre Channel controllers are used without connecting to Hard Disk Drives with OS installed, set the Option ROM (Running BIOS Setup utility) for the card to **Disabled**. For the setting, refer to *Chapter 2 (1. System BIOS)* in "Maintenance Guide".

3.5-inch Hard Disk Drive



2.5-inch Hard Disk Drive



1.12.1 Notes

Read the following notes when installing or removing a PCI card.

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- The server provides no connector to connect a LED connector which is supplied in RAID Controller used to indicate disk access.
- The search order for PCI bus slot on boot is as follows.
Slot 1A → Slot 1B
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or RAID System BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	PCI bus number	Device number	Function number
Onboard NIC1	39h	0	0
Onboard NIC2	39h	0	1
Slot 1A	1h	0	×
Slot 1B	2h	0	×

- Set **Disabled** for the optional ROM of a LAN device not to be booted by using the BIOS Setup utility.
- If an additional bootable PCI card (such as a RAID Controller, SAS controller, or LAN card) is installed, the boot priority may change. After the installation, set the boot priority in the **Boot** menu of the BIOS Setup utility.
- If a bootable device such as a PCI card or USB device is added, the boot order may change. In the BIOS Setup utility, select **Hard Drive BBS Priorities** from the **Boot** menu, and then specify a higher priority for the boot device.
Boot → Hard Drive BBS Priorities → Check the display
If the boot device is an HDD under an optional RAID Controller, the display is (Bus xx Dev 00) PCI RAID Adapter. Note that the value for xx changes depending on the PCI slot where a RAID board is installed.

1.12.2 Supported cards and available slots

The following tables list supported cards and slots available for them. For details of the functions of each board, refer to the manual supplied with the card.

Tips

- Different cards mounted on the same bus operate at the lower frequency.
- When the operation performance of a PCI card is higher than the PCI slot on the server, the PCI card operates with the performance of the PCI slot on the server.
- Standard network
Teaming among standard network controllers (both on-board cards) is supported.
- For the N8117-01A, use a cable with the following product name and designation:
Product name: RS-232C (B)
Designation: 804-062746-820

(1/2)

Model name	Product name		PCI 1A	PCI 1B	Remarks
		PCI slot performance ^{*1}	X16 lane	x4 lane	
		Transfer bandwidth (per lane)	8 Gb/s	5 Gb/s	
		Slot size	Low profile		
		PCI card type	x16 socket	x8 socket	
		Available card size	Up to 173 mm		
N8103-142	SAS controller (Card performance: PCI EXPRESS 2.0 (x8))		○	○	Dedicated to connecting external devices
N8103-171	RAID Controller (RAID 0/1) (Card performance: PCI EXPRESS 2.0 (x8))		—	○	Dedicated to connecting internal disks Cannot be installed with N8103-160
N8103-149	RAID Controller (512MB,RAID 0/1) (Card performance: PCI EXPRESS 2.0 (x8))		—	○	Dedicated to connecting internal disks An extra battery (N8103-154) can be connected
N8103-150	RAID Controller (512MB,RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		—	○	
N8103-151	RAID Controller (1 GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		—	○	
N8103-152	RAID Controller (1 GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 3.0 (x8))		—	○	For connecting internal disks The RAID cache can be backed up by using the flash backup unit that comes with N8103-167.
N8103-160	RAID Controller (1GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	○	For connecting HDDs An extra battery (N8103-162) can be connected Cannot be installed with N8103-171
N8190-153	Fibre Channel controller (8 Gbps/Optical) (Card performance: PCI EXPRESS 2.0 (x8))		○	○	For connecting an external Fibre Channel Cannot be installed with N8190-157/158
N8190-154	Fibre Channel controller (2 ch) (8 Gbps/Optical) (Card performance: PCI EXPRESS 2.0 (x8))		○	○	For connecting an external Fibre Channel Cannot be installed with N8190-157/158.
N8190-157	Fibre Channel controller (16 Gbps/Optical) (Card performance: PCI EXPRESS 3.0 (x8))		○	○	For connecting an external Fibre Channel Cannot be installed with N8190-153/154.
N8190-158	Fibre Channel controller (2 ch) (16 Gbps/Optical) (Card performance: PCI EXPRESS 3.0 (x8))		○	—	For connecting an external Fibre Channel Cannot be installed with N8190-153/154.
N8104-145	1000BASE-T connection board (2ch) (Card performance: PCI EXPRESS 2.0 (x4))		○	○	For additional LAN(Intel) Teaming (AFT/SFT/ALB) and bonding with only N8104-145 is supported. Cannot be installed with N8104-138/132.

(2/2)

Model name	Product name		PCI 1A	PCI 1B	Remarks
		PCI slot performance ^{*1}	X16 lane	x4 lane	
		Transfer bandwidth (per lane)	8 Gb/s	5 Gb/s	
		Slot size	Low profile		
		PCI card type	x16 socket	x8 socket	
		Available card size	Up to 173 mm		
N8104-138	1000BASE-T connection board (1ch) (Card performance: PCI EXPRESS 2.0 (x1))	○	○	For additional LAN	
N8104-132	1000BASE-T connection board (2ch) (Card performance: PCI EXPRESS 2.0 (x1))	○	○		
N8104-128	10GBASE-T connection board (SFP+/2 ch) (Card performance: PCI EXPRESS 2.0 (x8))	○	○	For additional LAN Prepare SFP module [N8104-129] if needed. Teaming (AFT/SFT/ALB) and bonding on the same board is supported. Only 1 team per system. For RHEL6 (x86), only one board can be installed	
N8104-131	10G Converged Network Adapter (Card performance: PCI EXPRESS 2.0 (x8))	○	○	For additional DCB/FcoE. SFP+ module is factory-installed. Teaming/bonding with LAN is not available. StoragePathSavior supports redundant bus of FC. Only one port per system is used for LAN. Teaming/bonding with LAN is not available.	
N8117-01A	Additional RS-232C connector kit	○	○	For additional serial (RS-232C) port Up to 1	

- Installed as standard ○ Can be installed – Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).

<e.g.> For PCI Express

1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)

For PCI Express 2.0

1 lane = 5 Gbps (unidirectional), 4 lanes = 20 Gbps (unidirectional)

For PCI Express 3.0

1 lane = 8 Gbps (unidirectional), 4 lanes = 32 Gbps (unidirectional)

Socket: Indicates the connector size. A card up to the number of sockets can be connected.

<e.g.> x4socket = x1card, x4card can be installed. x8 card cannot be installed.

* Maximum card depth that can be inserted.

LowProfile: Up to 173 mm

* For details of functions of each card, refer to the technical guide.

* The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.

* When the operation performance of a PCI card is higher than the PCI slot on the server, the PCI card operates with the performance of the PCI slot on the server.

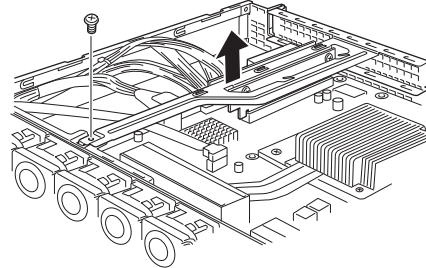
1.12.3 Installation

Install a riser card to a PCI card in the following procedure.

Important When installing a PCI card, make sure the connector of the card fits the connector of the riser card.

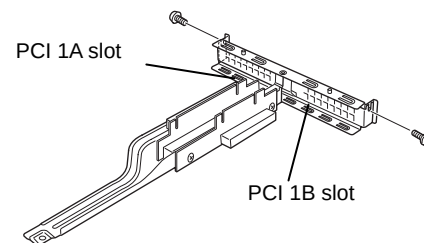
Note Check the card type (low profile or full-height type) which respective riser card supports and the type of PCI card to be installed.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Refer to *Chapter 2 (1.6 Removing the Top Cover)* to remove the top cover.
3. Remove the screw securing the riser card. Hold the both ends of the riser card and lift it off.



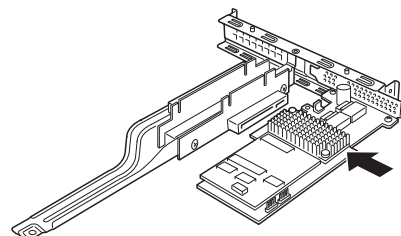
Note Be careful not to contact with other parts.

4. Confirm the installation position with the reference to the table on the previous pages.
5. Remove the screw from the riser card and remove the blank cover.



Note Keep the blank cover for future use.

6. Install a PCI card to the riser card. When installing the card, position the terminal part of the PCI card to the riser card slot and insert it.



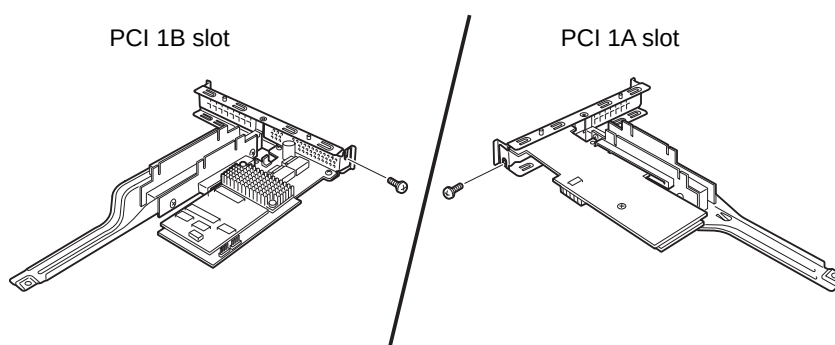
Important Do not touch the terminal part of riser cards or PCI cards and the signal pins of electric parts installed on the card. Installing cards with dirt or oil can cause malfunction.

Tips If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, a PCI card or riser card might break.

Note

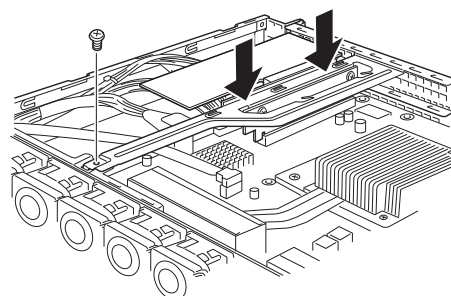
- Make sure that the head of a PCI card bracket is seated into the fixed slot.
- Depending on type of PCI cards, the terminal part of the PCI card may be too large to fit in the connector.

7. Fix the PCI card with the screw you removed in step 5.



Tips If the cable which is to be connected to the connector on the motherboard of the server is provided on the board, connect it to the board before installing the riser card to the server.

8. Connect the riser card to the motherboard slot and fix the card with the screw you removed in step 3.
When connecting the card, position the terminal part of the card to the slot on the motherboard and insert it.



9. Attach the removed components.
10. Turn on the server and make sure that no error messages are displayed on POST screen.
For details on POST error messages, refer to *Chapter 3 (1. POST Error Message)* in "Maintenance Guide".
11. Start the BIOS Configuration utility installed on the mounted board to set up the board.
Availability or startup and operation procedure of the utility depends on board. For details, refer to the manual that comes with the board. If a PCI card including RAID Controller, SAS controller, and LAN card which connects to any bootable device is added, the boot priority might be changed to the default setting. In that case, configure the boot priority in the **Boot** menu of the BIOS Setup utility. For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "Maintenance Guide".

When using the optional controller (N8103-171/149/150/151/152/160)

For details, refer to the manual that comes with optional RAID Controller (N8103-171/149/150/151/152/160).

Important The optional RAID Controller is extremely sensitive to static electricity. Touch metal part of the server such as the frame to discharge static electricity from your body before handling a RAID Controller. Do not touch the terminal part or parts of RAID Controller board with bare hands or do not place the board directly on a desk. For detailed explanation on static electricity, refer to *Chapter 2 (1.2 Anti-static Measures)*.

Note

- When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot xx ROM** (xx is PCI slot number) is set to **Enabled**.
- When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.

Important Do not change the mode to hibernate when building a RAID System.

1.12.4 Removal

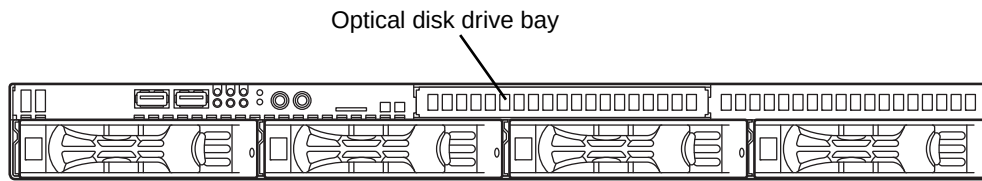
To remove a riser card, reverse the installation procedure. Hold the riser card to which the PCI card is attached firmly and remove it. When removing it, have another person hold the server so that the server does not move.

If using the server while the PCI card is removed, attach the blank cover that comes with the riser card.

1.13 Optical Disk Drive

This section describes the procedure for installing the optional optical disk drive.

Important Do not install any unsupported optical disk drive.

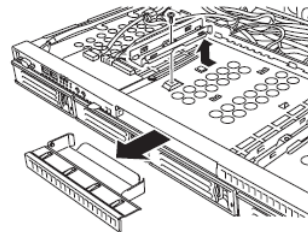


1.13.1 Installation

Install an optical disk drive in the following procedure.

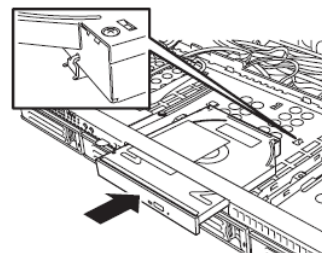
(a) 3.5-inch drive model

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Refer to *Chapter 2 (1.6 Removing the Top Cover)* to remove the top cover.
3. Unscrew one of the screws securing the bracket of the optical disk drive and remove the optical disk drive cover.

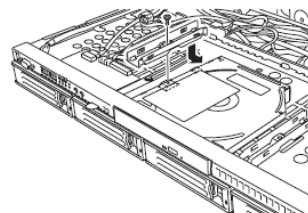


Important Keep the screw and dummy tray in the optical disk drive for future use.

4. Install the optical disk drive.



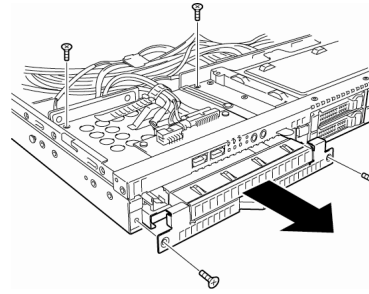
5. Screw the bracket you removed in step 2 to secure the optical disk drive in place.



6. Put the removed components.

(b) 2.5-inch drive model

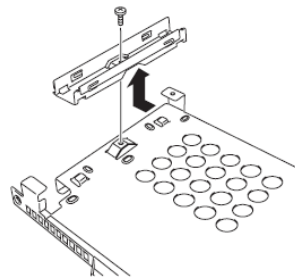
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Refer to *Chapter 2 (1.6 Removing the Top Cover)* to remove the top cover.
3. Remove the two screws on the front and the two screws securing the optical disk drive tray, and pull the tray out.



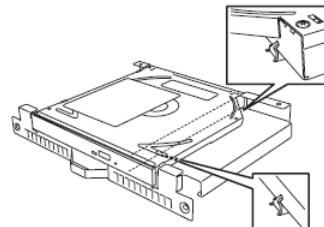
4. Remove the optical disk drive cover.

Important | Keep the screw and dummy tray in the optical disk drive for future use.

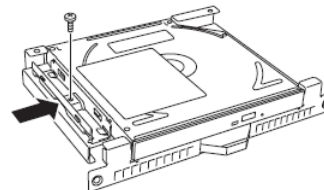
5. Unscrew and remove the bracket securing the Hard Disk Drive of the tray which you pulled out in step 3.



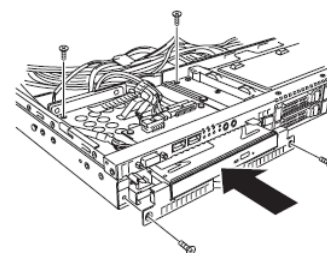
6. Install the optical disk drive.



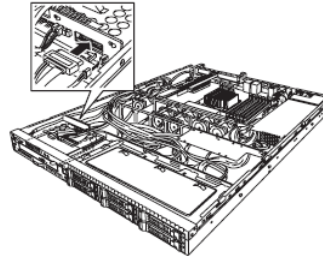
7. Screw the bracket securing the optical disk drive.



8. Insert the optical disk drive tray and secure four screws removed in step 3 to fix the optical disk drive tray to chassis.



9. Connect the optical disk drive cable.



10. Put the removed components in place.

1.13.2 Removal

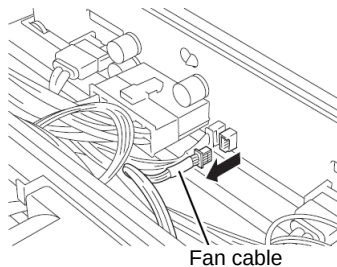
To remove an optical disk drive, reverse the installation procedure above.

1.14 Redundant Fan

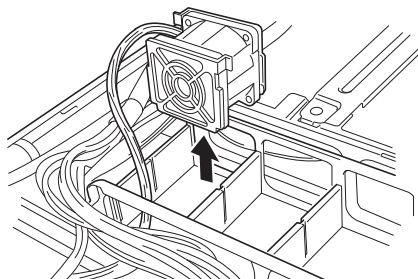
Replace the standard cooling fan with an optional redundant fan to make redundant fan configuration.

1.14.1 Replacing the standard fan unit with redundant fan unit

1. Replacing the standard fan unit with redundant fan unit
2. Remove the top cover according to *Chapter 2 (1.6 Removing the Top Cover)*.
3. Disconnect the fan cable from the backplane.

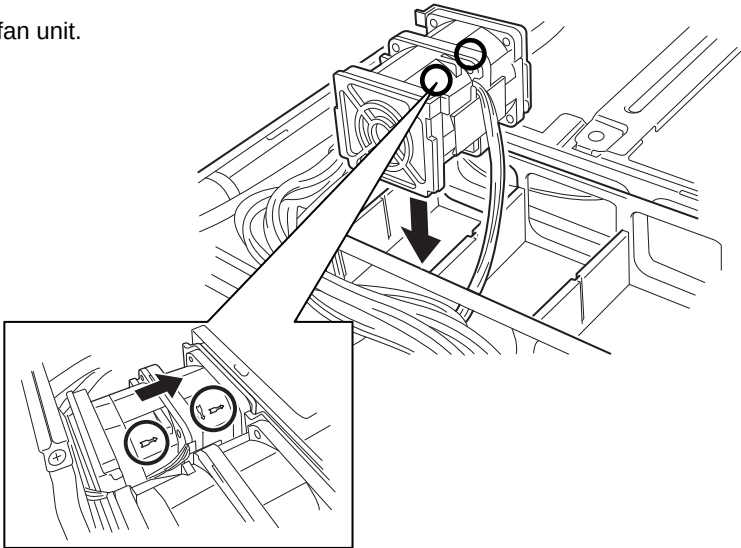


4. Lift the fan unit straight to remove it.



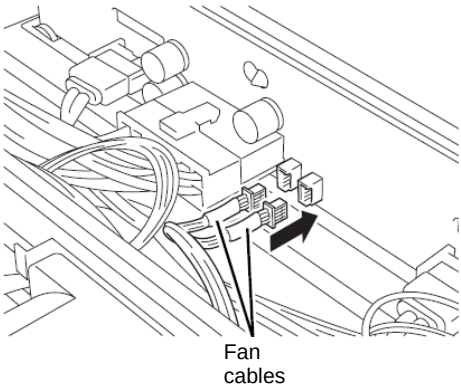
Important | Keep the removed fan unit for future use.

- 5. Install the redundant fan unit.

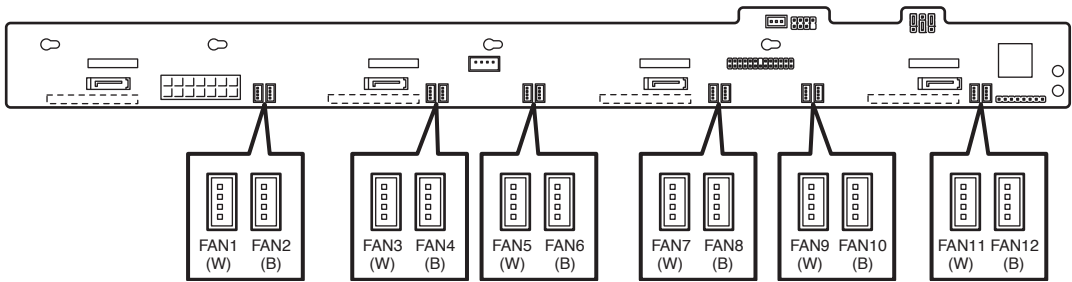


Important Make sure that the fan unit faces rearward of the chassis as shown by the arrows that indicate the air flow.

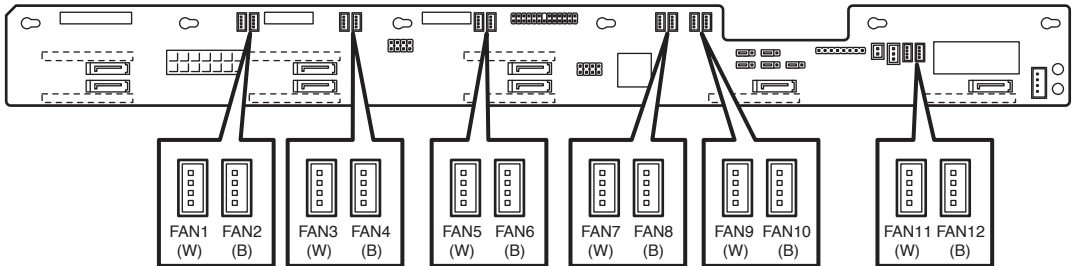
- 6. Connect the fan cables to the backplane. Make sure that the fan cables are not caught in the top cover, fan, or chassis.



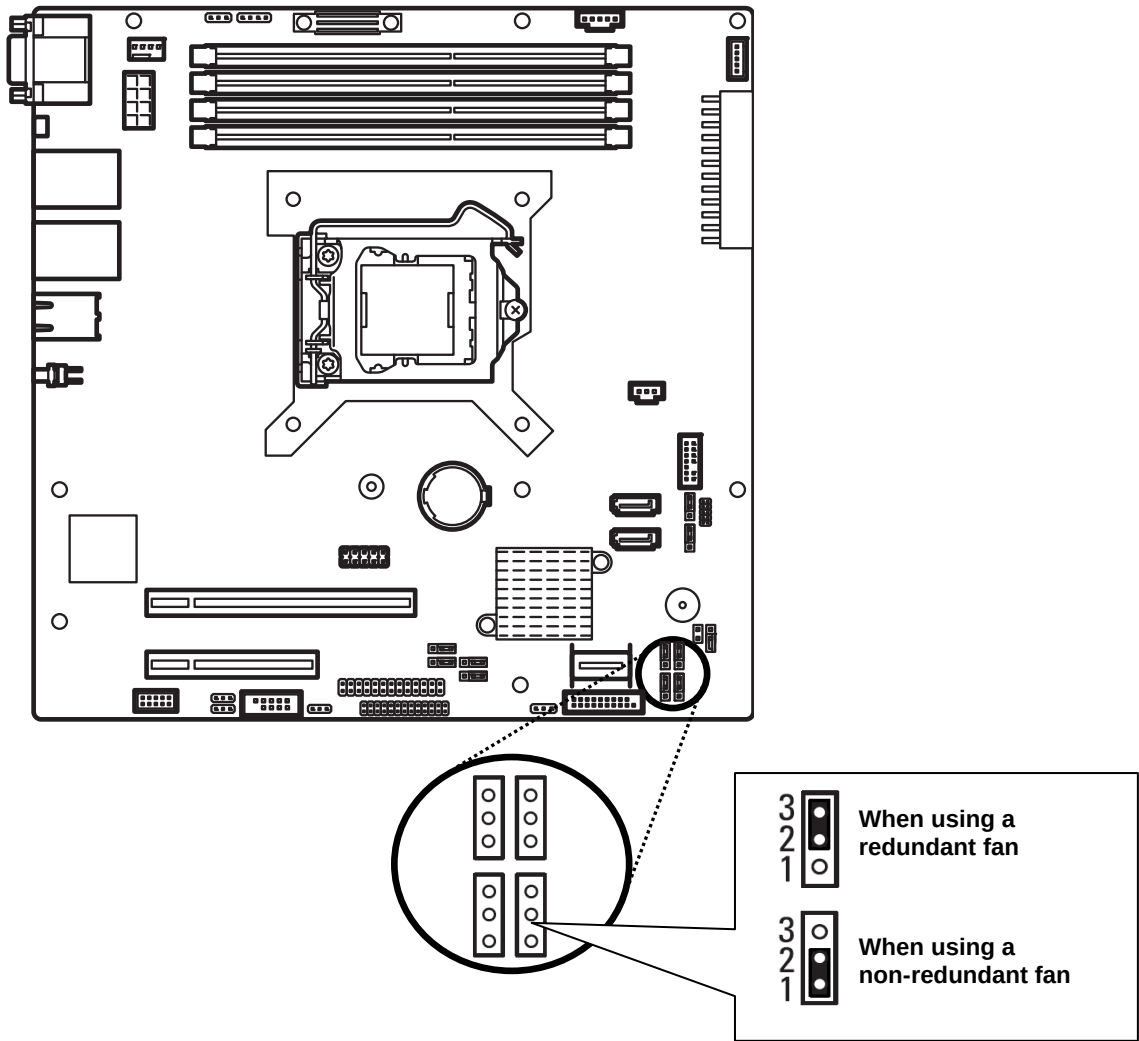
Backplane for 3.5-inch Hard Disk drive



Backplane for 2.5-inch Hard Disk drive



7. Change the setting of jumper pins on the motherboard, as shown in the figure below.

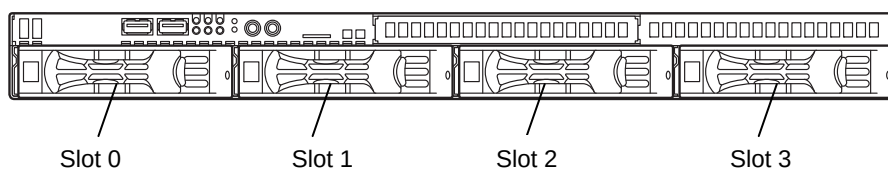


Important Do not change the setting of other jumper pins. Doing so may cause malfunction or failure of the server.

1.15 3.5-inch Hard Disk Drive

A Hard Disk Drive mounted in a dedicated tray can be purchased. Install the Hard Disk Drive on the server with it mounted on the tray.

The Hard Disk Drive bays can accommodate up to four Hard Disk Drives. Slot numbers have been assigned to each bay. Refer to the figure below.



Important

- Use Hard Disk Drives specified by NEC. Installing a third-party Hard Disk Drive might cause a failure of the server and the Hard Disk Drive.
- Hard Disk Drives with different types of interfaces or different rotational speeds cannot be installed together.
- If using Hard Disk Drives in a RAID System, jumper settings or a change of cables may be required.

1.15.1 Installation

Install a Hard Disk Drive by using the following procedure. Follow the same installation procedure for other bays.

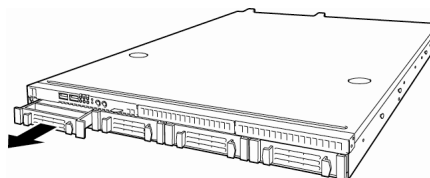
Important

In the RAID System, build a Disk Array using Hard Disk Drives that have the same specifications (capacity, rotational speed, and standard).

Tips

Hard Disk Drives can be installed or removed simply by removing the front bezel.

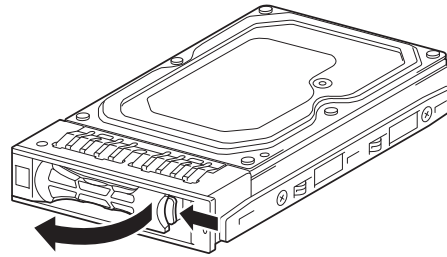
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the bay where you install the Hard Disk Drive.
The server provides four bays. Install Hard Disk Drives in ascending order of bay number. For details, refer to *Chapter 2 (1.15 3.5-inch Hard Disk Drive)*.
3. Remove the dummy trays.
Dummy trays are installed in all bays.



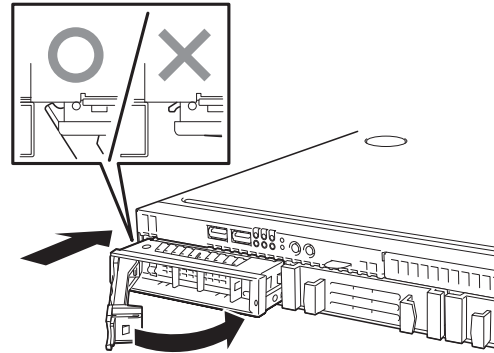
Important

- Keep the dummy trays for future use.
- Dummy trays are intended to increase the cooling effect inside the server. Keep the dummy trays installed in bays where Hard Disk Drives are not installed.

4. Unlock the handle of the tray.



5. Hold the tray and its handle and insert it into the bay.

**Note**

- Push it all the way until the handle's lock touches the frame.
- Hold the tray firmly with both hands.

6. Slowly close the handle.
The tray is locked making a clicking sound.

Important

Do not get your finger caught between the handle and the tray.

Note

When you push the drive into the bay, confirm the handle got hooked on the frame.

7. Turn on the server, start the SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "Maintenance Guide".
8. Refer to *Chapter 2 (1.20 Attaching the Front Bezel)* to put the front bezel back.

1.15.2 Removal

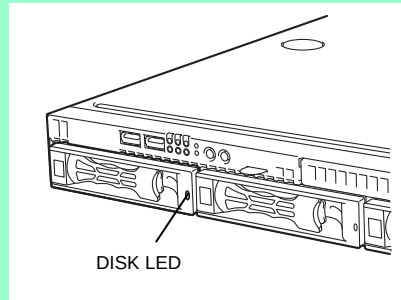
Remove a Hard Disk Drive in the following procedure.

Important

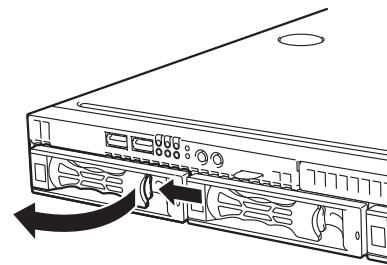
If you dispose of the removed hard disk drive, follow instructions described in *Chapter 1 (1. Transfer, Movement, and Disposal)* in "Maintenance Guide".

Note

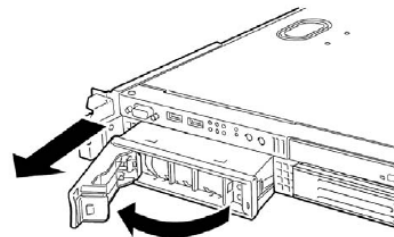
If you have to remove a failed hard disk drive, check the bay with its **DISK LED** lit amber.



1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Push the lever to unlock and open the handle.



3. Hold the handle and tray firmly and pull the Hard Disk Drive out.
4. If you intend to use the server with the Hard Disk Drive removed, fill the open bay with the dummy tray.

**Note**

Do not pull the handle to remove the hard disk drive. Doing so may damage the handle.

5. Turn on the server, start the SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "Maintenance Guide".
6. Refer to *Chapter 2 (1.20 Attaching the Front Bezel)* to put the front bezel back.

***1.15.3* Replacing a Hard Disk Drive in the RAID System**

In the RAID System, you can use the auto rebuild feature that can restore the data back to the state before the failure occurred by writing the data saved before the replacement to a new Hard Disk Drive after replacing the broken Hard Disk Drive.

The auto rebuild feature is enabled in Logical Drives set to RAID 1, RAID 5, RAID 6, RAID 10, and RAID 50.

The disk is automatically rebuilt when hot swapping (replacing a disk while the power is on) a failed Hard Disk Drive.

During the auto rebuild, the DISK LED on the Hard Disk Drive flashes green and amber alternately to indicate that auto rebuild is being performed.

Observe the following precautions whenever executing auto rebuild.

- Do not turn off the server until auto rebuild completes after a Hard Disk Drive fails.
- Leave an interval of at least 90 seconds between a Hard Disk Drive removal and a Hard Disk Drive installation.
- Do not replace a disk during the auto rebuilding of another Hard Disk Drive (during an auto rebuild, the DISK LED on the Hard Disk Drive flashes green and amber alternately).

1.16 2.5-inch Hard Disk Drive

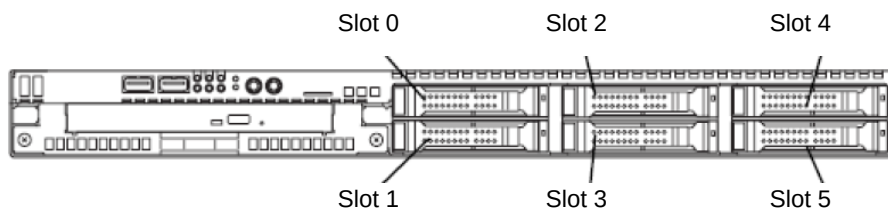
A Hard Disk Drive mounted in a dedicated tray can be purchased. Install the Hard Disk Drive on the server with it mounted on the tray.

Important

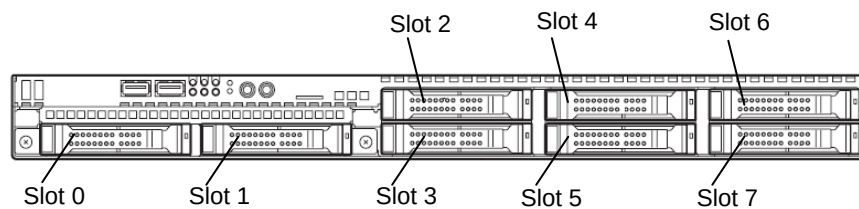
- Use Hard Disk Drives specified by NEC. Installing a third-party Hard Disk Drive might cause a failure of the server and the Hard Disk Drive.
- Hard Disk Drives with different types of interfaces or different rotational speeds cannot be installed together.
- Hard Disk Drives and SSD can be installed together. However, you cannot install them together within the same RAID System.
- If using Hard Disk Drives in a RAID System, jumper settings or a change of cables may be required.

Hard Disk Drive bays can accommodate up to six Hard Disk Drives. Slot numbers have been assigned to each bay. Refer to the figure below.

<1 to 6 drives model>



<1 to 8 drives model>



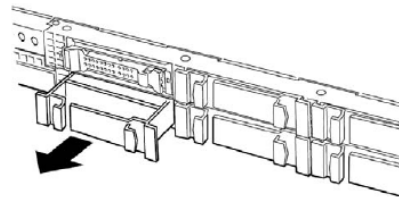
1.16.1 Installation

Install a Hard Disk Drive by using the following procedure. Follow the same installation procedure for other bays.

Important In the RAID System, build a Disk Array using Hard Disk Drives that have the same specifications (capacity, rotational speed, and standard).

Tips Hard Disk Drives can be installed or removed simply by removing the front bezel.

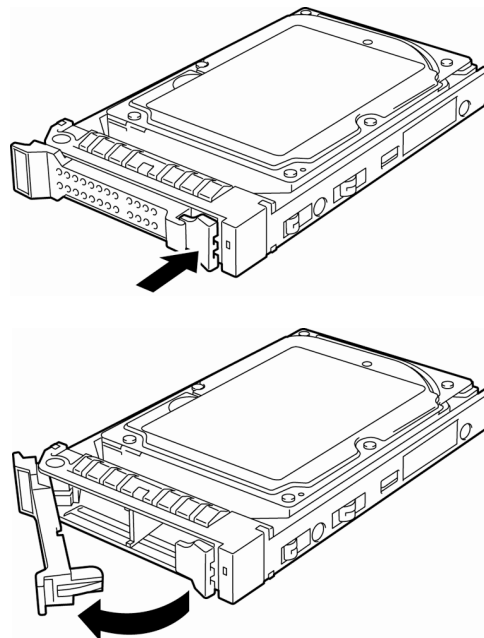
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the bay where you install the Hard Disk Drive.
The server provides six bays. Install Hard Disk Drives in ascending port number order. For details, refer to *Chapter 2 (1.15 3.5-inch Hard Disk Drive)*.
3. Remove the dummy trays.
Dummy trays are installed in all bays.



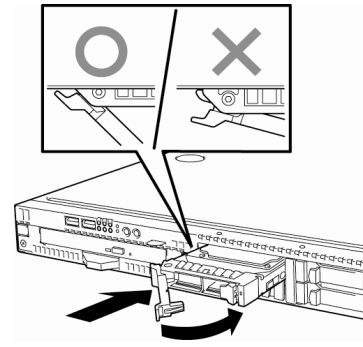
Important

- Keep the dummy trays for future use.
- Dummy trays are intended to increase the cooling effect inside the server. Keep the dummy trays installed in bays where Hard Disk Drives are not installed.

4. Unlock the handle of the tray.



5. Hold the tray firmly and insert it into the bay.

**Note**

- Push it all the way until the handle's lock touches the frame.
- Hold the tray firmly with both hands.

6. Slowly close the handle.
The tray is locked making a clicking sound.

Important

Do not get your finger caught between the handle and the tray.

Note

When you push the drive into the bay, confirm the handle got hooked on the frame.

7. Turn on the server, start the SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "Maintenance Guide".
8. Refer to *Chapter 2 (1.20 Attaching the Front Bezel)* to put the front bezel back.

1.16.2 Removal

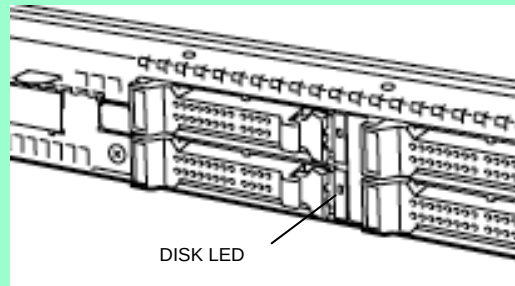
Remove a Hard Disk Drive in the following procedure.

Important

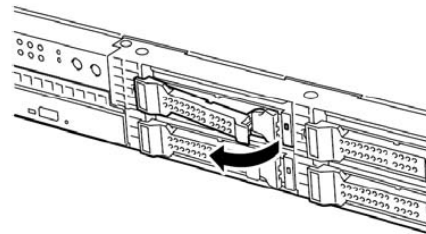
If you dispose of the removed hard disk drive, follow instructions described in *Chapter 1 (1. Transfer, Movement, and Disposal)* in "Maintenance Guide".

Note

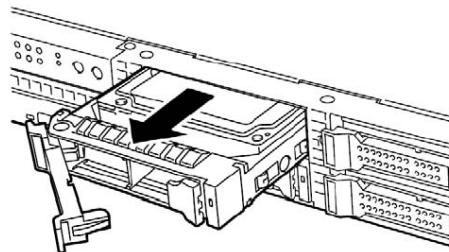
If you have to remove a failed hard disk drive, check the bay with its DISK LED lit in amber.



1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Push the lever to unlock and open the handle.



3. Hold the tray firmly and pull out the Hard Disk Drive.
4. If you intend to use the server while the Hard Disk Drive is removed, fill the open bay with a dummy tray.



Note

Do not pull the handle to remove the hard disk drive. Doing so may damage the handle.

5. Turn on the server, start the SETUP utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, refer to *Chapter 2 (1.2.5 Boot)* in "Maintenance Guide".
6. Refer to *Chapter 2 (1.20 Attaching the Front Bezel)* to put the front bezel back.

1.16.3 Replacing a Hard Disk Drive in the RAID System

In the RAID System, you can use the auto rebuild feature to restore data back to the state before a failure occurred by writing the data saved before the replacement to a new Hard Disk Drive after replacing the broken Hard Disk Drive.

The auto rebuild feature is enabled in logic drives set to RAID 1, RAID 5, RAID 6, RAID 10, RAID 50 and RAID 60.

The disk is automatically rebuilt when hot swapping (replacing a disk while the power on) a failed Hard Disk Drive.

During auto rebuild, the DISK LED on the Hard Disk Drive flashes green and amber alternately to indicate that auto rebuild is being performed.

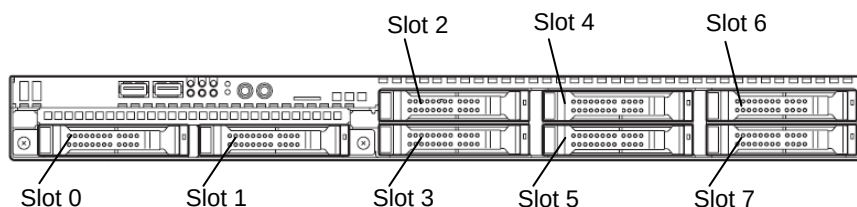
Observe the following precautions whenever executing the auto rebuild

- Do not turn off the server until the auto rebuild completes after a Hard Disk Drive fails.
- Leave an interval of at least 90 seconds between a Hard Disk Drive removal and a Hard Disk Drive installation.
- Do not replace a disk during the auto rebuilding of another Hard Disk Drive (during an auto rebuild, the DISK LED on the Hard Disk Drive flashes green and amber alternately).

1.17 Extra 2.5-inch HDD Cage

If the extra 2.5-inch HDD cage N8154-52 is installed in the 2.5-inch drive model, you can use the server with two to eight hard disk drives connected.

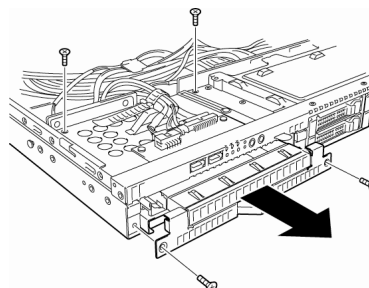
- You need to prepare the internal SAS/SATA cables K410-240(00) (for ports 0 to 3) and K410-204(00) (for ports 4 to 7) separately available.
- The slot numbers are assigned as shown below when the extra 2.5-inch HDD cage is installed.



1.17.1 Installation

Install the extra 2.5-inch HDD cage by using the following procedure.

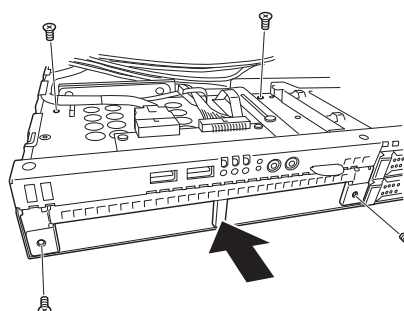
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Refer to *Chapter 2 (1.6 Removing the Top Cover)* to remove the top cover.
3. Remove the two screws from the front panel and two screws from the optical disk drive, and then pull out the optical disk drive tray.



4. Remove the cover from the optical disk drive.

Important Keep the removed cover for future use.

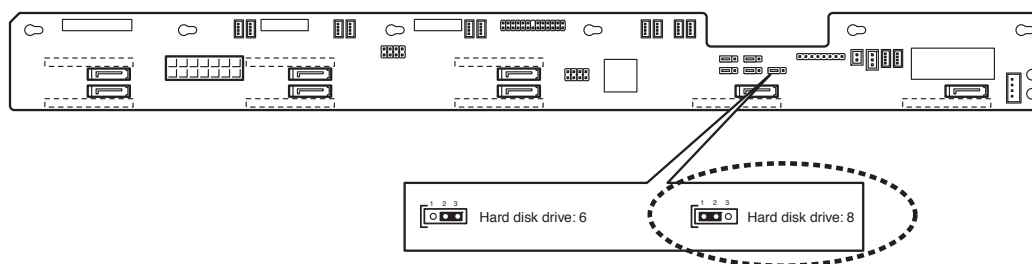
5. Insert the extra 2.5-inch HDD cage into the slot, and secure it to the server chassis with the four screws removed in step 3.



6. Change the setting of jumper J6 on the backplane for the hard disk drive.

When six hard disk drives are connected: 2-3 (default)

When eight hard disk drives are connected: 1-2

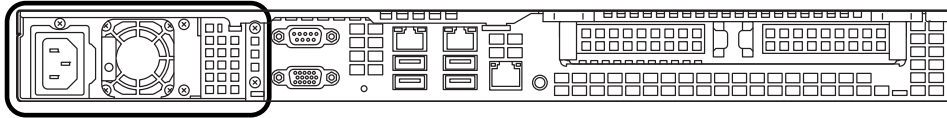


7. Change the cable connection between the optional RAID Controller and the backplane for the hard disk drive. For details, refer to *Chapter 2 (1.10.1 Connecting cables)*.
8. Attach the removed components.

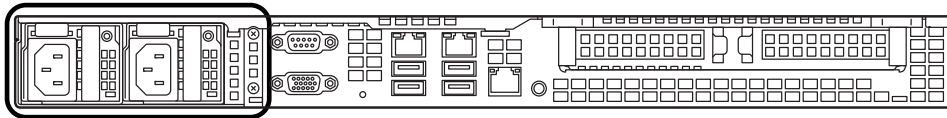
1.18 Redundant Power Supply Unit (2x 500W)

Replace the standard power supply unit with an optional redundant power supply unit to make redundant power supply configuration.

< When a non-redundant power supply unit is installed >

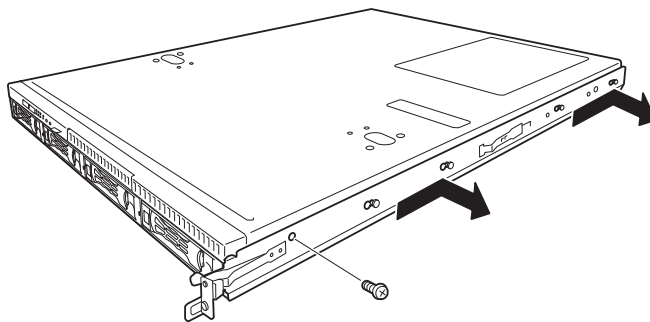


< When a redundant power supply unit is installed >



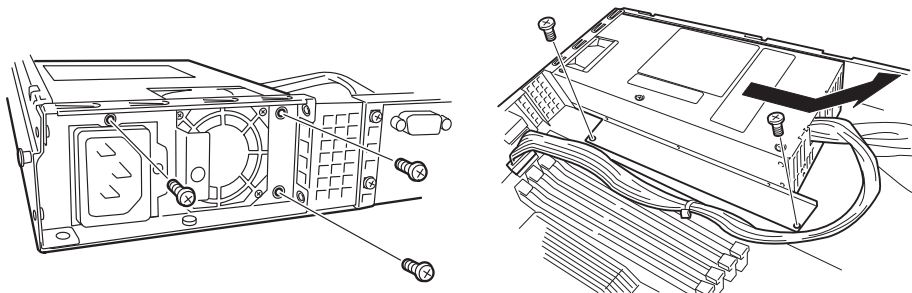
1.18.1 Replacing the standard power supply unit with redundant power supply unit

1. See *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the right inner rail (when viewed from the front of the server).

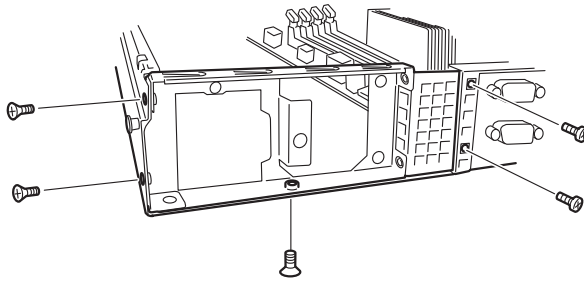


Remove a single screw, move the inner rail toward rear of the server, and remove the inner rail.

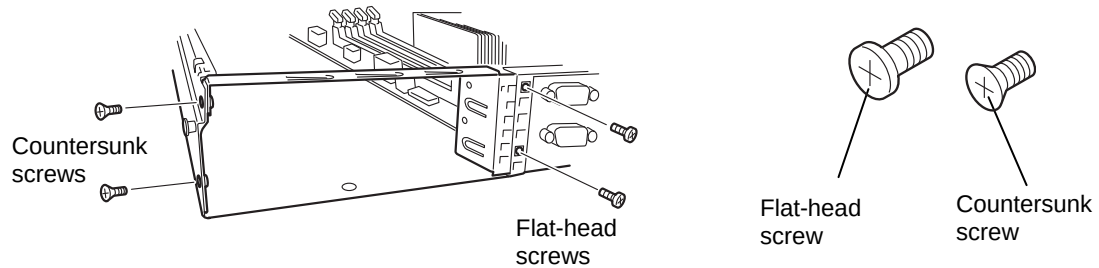
3. Remove the top cover according to *Chapter 2 (1.6 Removing the Top Cover)*.
4. Disconnect four power cables from the motherboard and backplane for hard disk drive.
5. Remove the five screws from the power supply unit, and take the power supply unit out from the chassis.



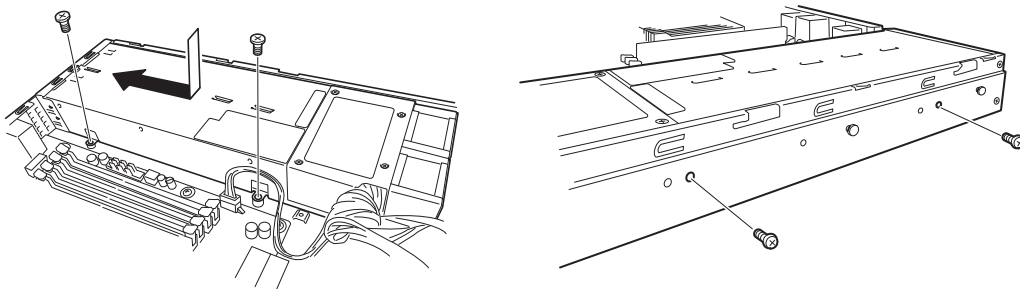
6. Remove the five screws to remove the bracket for the power supply unit.



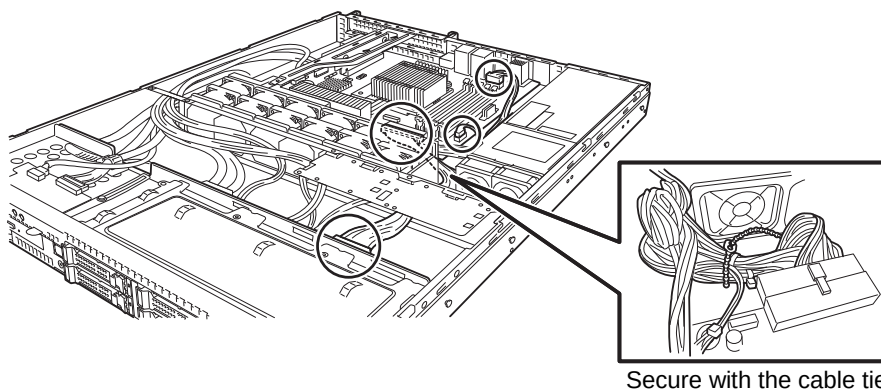
7. Mount the bracket for the redundant power supply unit with four screws (two flat-head screws and two countersunk screws). The bracket is provided with the redundant power supply unit.



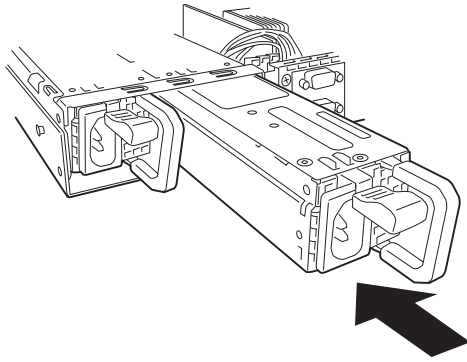
8. Mount the power cage to the chassis with four screws.



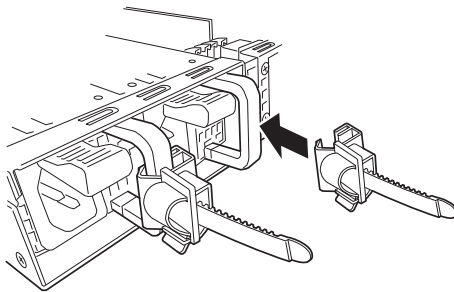
9. Connect the four cables to the motherboard and backplane for hard disk drives.



10. Insert the two redundant power supply units into two slots in the power cage.

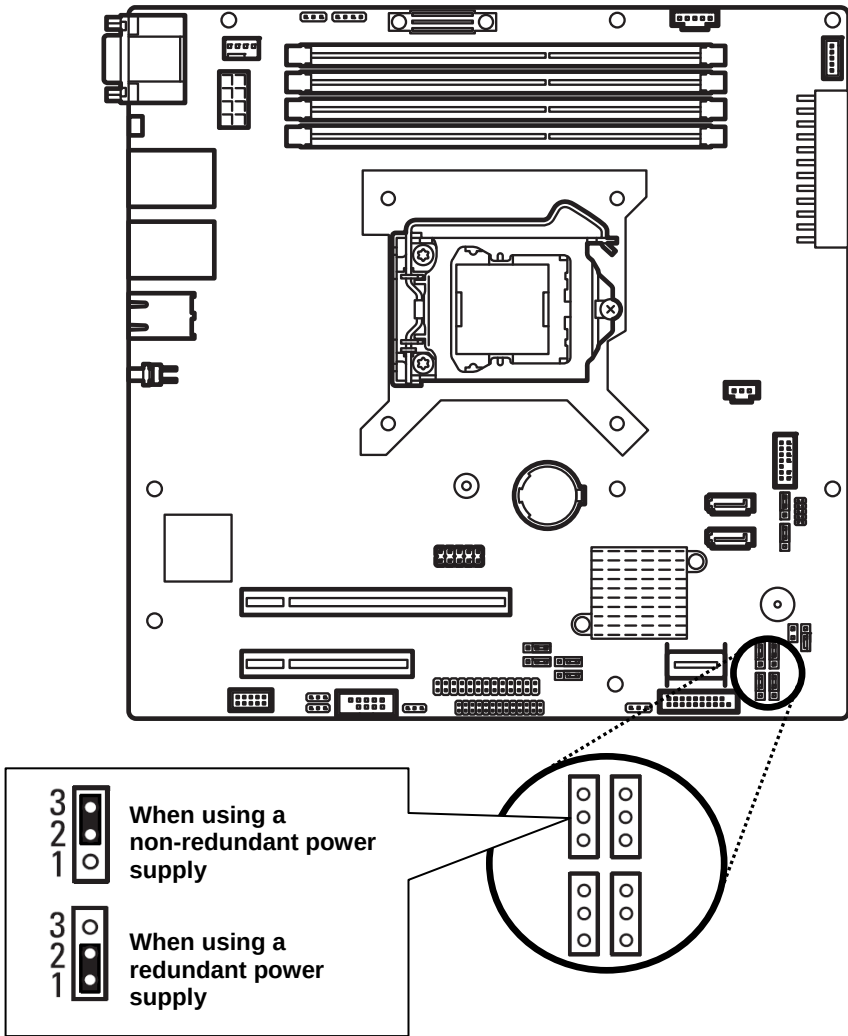


11. Attach the cable tie that comes with the redundant power supply unit to the handle of the redundant power supply unit



12. Install the components you have removed in earlier steps.

13. Change the setting of jumper pins on the motherboard, as shown in the figure below.

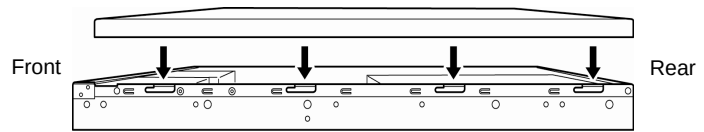


Important Do not change the setting of other jumper pins. Doing so may cause malfunction or failure of the server.

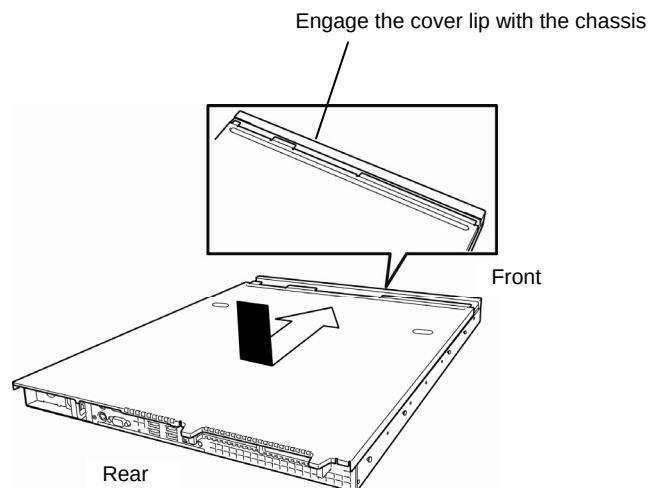
14. Update SDR by using SDR Update CD that comes with the redundant power supply.

1.19 Attaching the Top Cover

When attaching the top cover, make sure that the tab is securely inserted into the server frame, and then slide it forward. The top cover is locked when it makes a clicking sound.

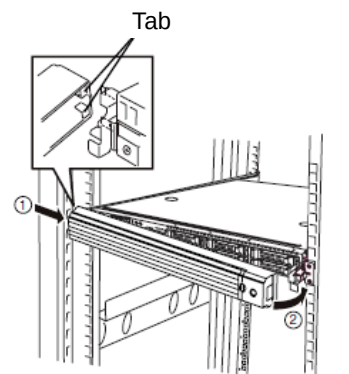


At that time, check the release button. If the cover is locked, the button is raised. If the button stays depressed, slide the cover backward again. If that does not work, remove the top cover and try again.



1.20 Attaching the Front Bezel

When attaching the front bezel, orient it so that the alignment tab on the left fits into the server frame. After that, lock it with the bezel lock key.



Important Be careful not to accidentally press the POWER switch when removing the front bezel.

2. Installation and Connection

This section describes how to position the server and connect cables.

2.1 Installation

This server must be mounted to a rack which conforms to EIA standards for use.

2.1.1 Installing Rack

Refer to the manual that comes with your rack for how to install the rack, or consult with your sales representative.

 WARNING	
	Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to <i>Safety precautions in Precautions for Use</i>. • Use only in the specified environment. • Do not connect the ground wire to a gas pipe.

 CAUTION	
	Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to <i>Safety precautions in Precautions for Use</i>. • Do not carry or install the server only by a single person. • Do not install the server so that the load may be concentrated on a specific point. • Do not install any components only by a single person. Confirm that hinge pins of the door are completely secured in place. • Do not pull out the server from the rack when the rack is unstable. • Do not leave more than one device being pulled out from the rack. • Do not provide the wiring for the server to exceed the rating of the power supply. • Do not use in the environment where corrosive gas is generated.

Do not install the rack or server under the following environment. Doing so may cause malfunction of the server.

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist
Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals
- Place where chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed (If unavoidable, contact your maintenance service company for proper shield construction.)
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, have your maintenance service company separate power cables or install noise filter.

2.1.2 Installing the server to the rack or removing it from the rack

Mount the server to the rack. (This section also describes the removal procedure.)

 WARNING	
	Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to <i>Safety precautions in Precautions for Use</i>. • Do not use any racks out of standards. • Use only under the specified environment.

 CAUTION	
	Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to <i>Safety precautions in Precautions for Use</i>. • Do not drop. • Do not leave the server being pulled out. • Do not install with the cover removed. • Do not get your fingers caught.

Important

Temperature increases and airflow in the rack

If multiple devices are installed, or if the inside of the rack is not sufficiently ventilated, the internal temperature rises due to the heat emitted from each device, which may result in a malfunction. Review airflow in the rack and room and take sufficient measures so that the internal temperature will not exceed the operational temperature during operation.

Air enters the server from the front and exits from the rear.

(1) Installation

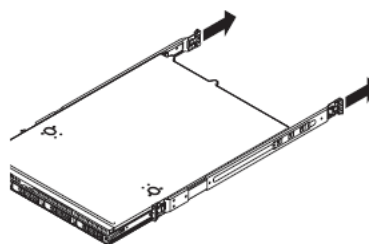
This server can be mounted to a rack made by NEC or other companies. Mount the server to a rack in the following procedure.

- **Preparation for mounting**

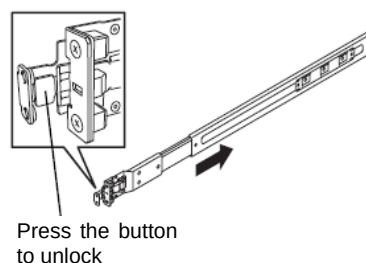
The left and right slide rails are fixed with tape at the front and side faces to prevent falling off during transportation. Remove the tape before mounting it to the rack.

- **Removing rail assemblies**

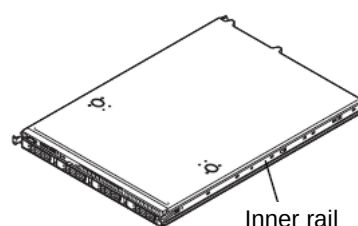
1. Remove the slide rails from left and right sides of the server.



2. While pressing the unlock button at the front of the server, hold the rail and slowly slide it backward.



3. After removing the outer rail, only the inner rail is screwed to the server.



- Important**
- The outer rail removed is used later in the subsequent procedure.
 - Be careful not to get your finger caught in the rail.

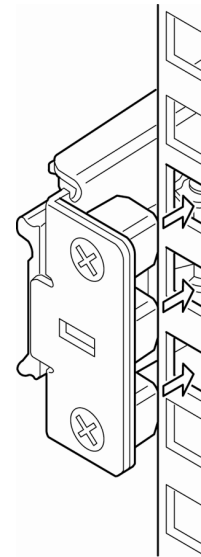
- **Installing outer rail**

Attach the outer rail you previously removed to the rack.

Fit the square-shaped protrusions of the rail to the square holes of a 19-inch rack. Make sure that it makes a clicking sound indicating that it is locked.

The image on the right shows the front right side (front) of the rack. Install to the rear right side and front and rear left sides following the same procedure.

Make sure that the rail assembly is installed at the same height as the other slide rail already installed.



Important Confirm that the rails are securely locked so that they will not fall off.

Tips Although the rail assembly may be somewhat unsteady, it is not defective.

- **Installing the Server**

CAUTION



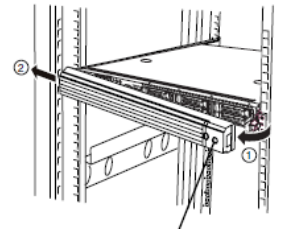
Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use*.

- Do not drop.
- Do not leave the server being pulled out.
- Do not install with the cover removed.
- Do not get your fingers caught.

(2) Removal procedure

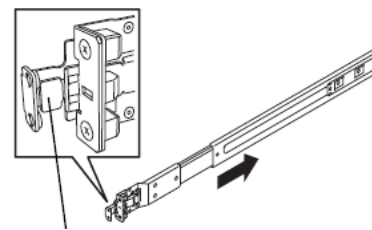
Remove the server from the rack in the following procedure. This can be removed by one person but it is recommended more than one person work on this together.

1. Make sure that the server is turned off and then disconnect the power cord or all cables from the server.
2. Unlock the front bezel and remove it.



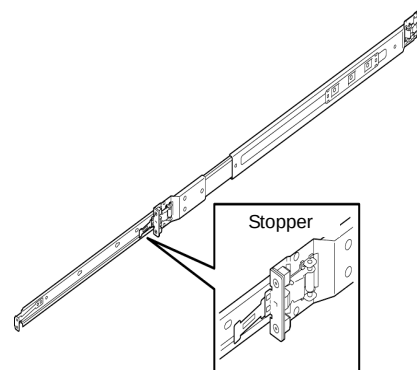
Key slot

3. Slowly pull the server out while pressing the unlock buttons located on either side of the front of the server.



Press the button to unlock

4. Because there are stoppers, the server will come to a stop halfway. Press and hold the stoppers on the rails and pull the server out of the rack.



Stopper

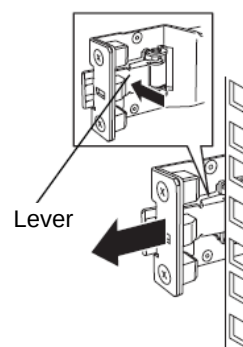
Important Be careful not to get your fingers caught in the rails and levers.

5. Hold the server firmly and remove it from the rack.

Important

- While more than one person is supporting the bottom part of the server, slowly pull out the server.
- Do not apply pressure on the server from top when it is being pulled out. Doing so cause the server to drop, which is dangerous.
- Be careful not to get your finger caught in rails.

6. When removing the rail from the rack, pull the rail in the direction of the arrows while pressing the lever.



(3) Removing outer rails

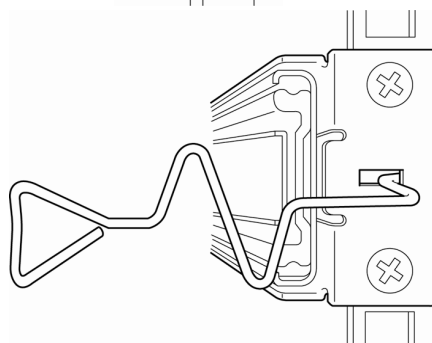
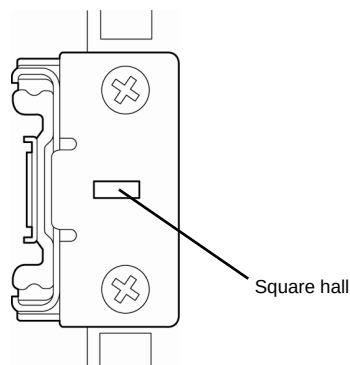
If multiple rails are installed, it might be impossible to push the unlock lever. If this happens, remove the rail from the rack by using the following procedure.

1. Refer to *Chapter 2 (2.1.2) - (2) Removal procedure* to remove the server from the rack.

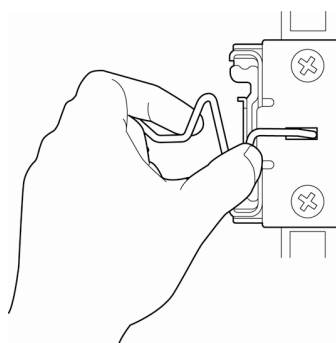
2. Prepare the designated tool to remove slide rail (outer rail) that comes with the server.



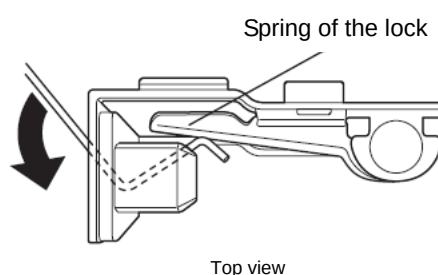
3. Insert the tool into the square hole at the front of a rail as shown in the image on the right.



4. Unlock the rail by pressing the tool in the direction as shown in the image on the right.

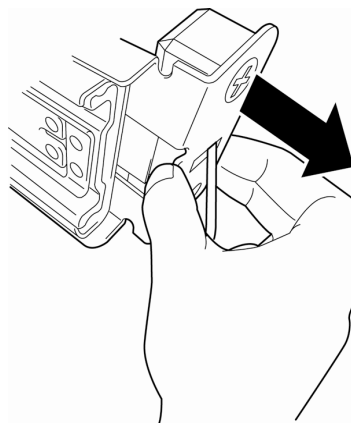


Front view

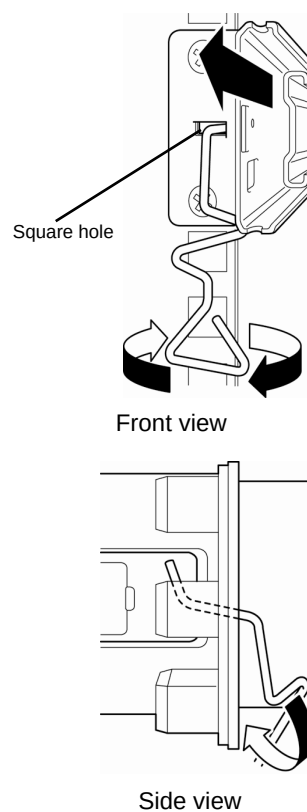


Top view

5. Remove the rail from the rack while it is being unlocked.



6. Insert the tool into the square hole at the rear of the rail in the direction described. As shown in the image on the right, rotate the tool to unlock it.
7. Remove the rail while it is being unlocked.



2.2 Connection

Connect peripheral devices to the server.

Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. Images on the following pages show the peripheral devices that can be connected in their standard state and their respective connector positions. First connect the peripheral devices and then connect the power cord to the server. After that, connect the power plug to the outlet.

Tips

If you have a request regarding system configuration including connection to UPS or automatic power control system and setting for timer controlled operation, connection to server switch unit and its setting, ask a service technician (or a system engineer) of your maintenance service company.

WARNING



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions in Precautions for Use*.

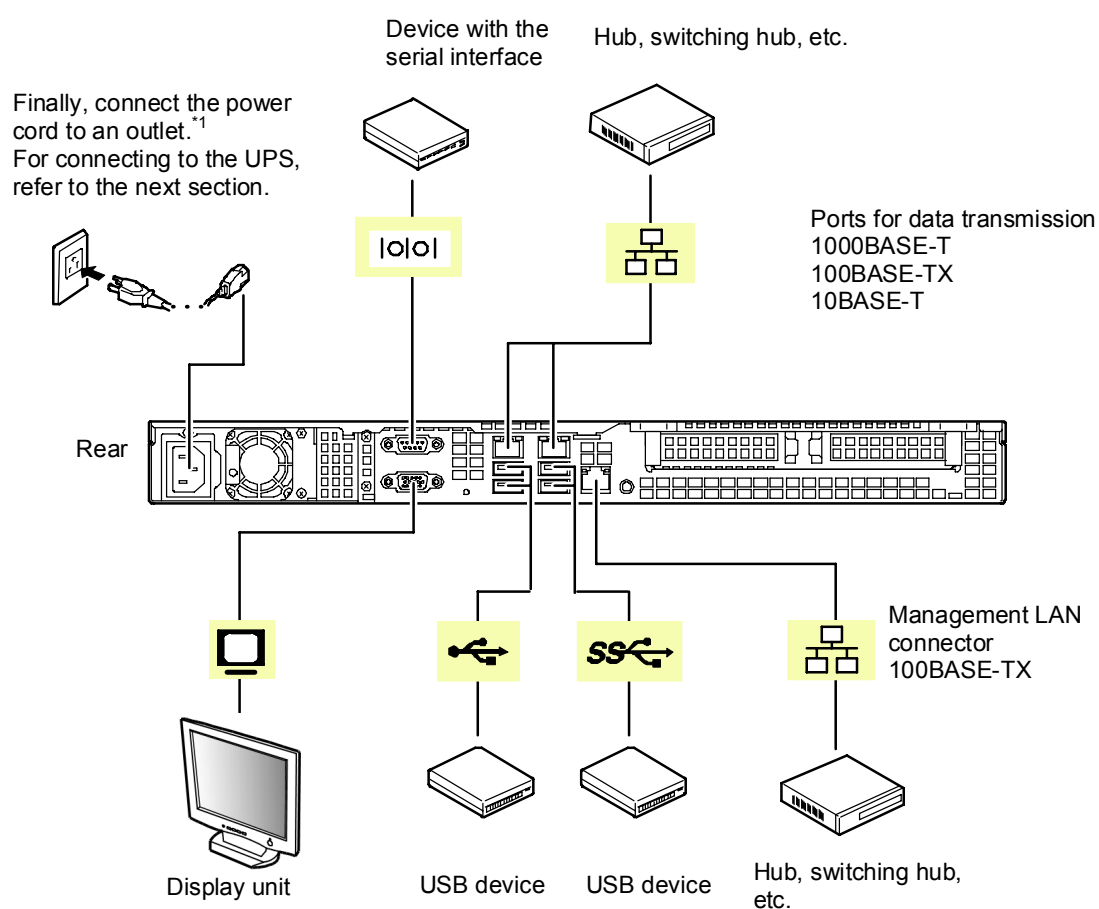
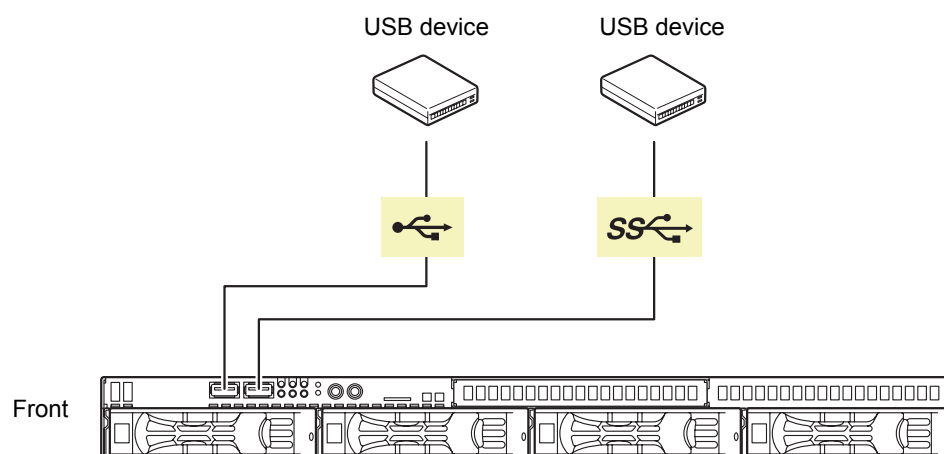
- Do not hold the power plug with wet hands
- Do not connect the ground wire to a gas pipe

CAUTION



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions in Precautions for Use*.

- Use only the specified outlet to insert.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use only the specified power cord
- Do not connect or disconnect the interface cable with the power plugged in the outlet.
- Use only the specified interface cable



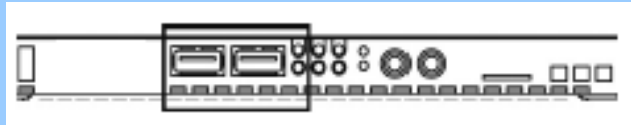
*1 Connect the power cord to a circuit breaker of up to 15 A.
To prevent power cord from disconnecting, secure the power cord with the provided cable tie.

Important Use of external USB devices

If you connect an external USB DVD-ROM drive to a USB connector at the front of the server, do not connect any other device to the adjacent USB port.

* The ports in a box in the images below are “adjacent USB ports”.

USB connectors at the front of the server

**Important**

- Turn off the server and peripheral devices to be connected before connecting. Connecting with power ON can cause malfunction or failure.
- If connecting any peripheral device and its interface cable made by other companies (a third party), contact the store where you purchased them to check if they can be used with the server beforehand. Some devices from a third party cannot be used with the server.
- Fix the power cord or interface cable with cable ties.
- Organize cables so that they will not contact the door of the rack or the guide rails on the sides.
- When extending the server from the rack, disconnect the power cord and interface cables.
- Make sure that no pressure is applied on the plug of power cord.
- Be sure to use the display unit specified by NEC. The operation is not guaranteed if you install a display unit not specified by NEC.

Note

If you connect a card to a line, use the card which you have applied for with the certification authority.

Tips

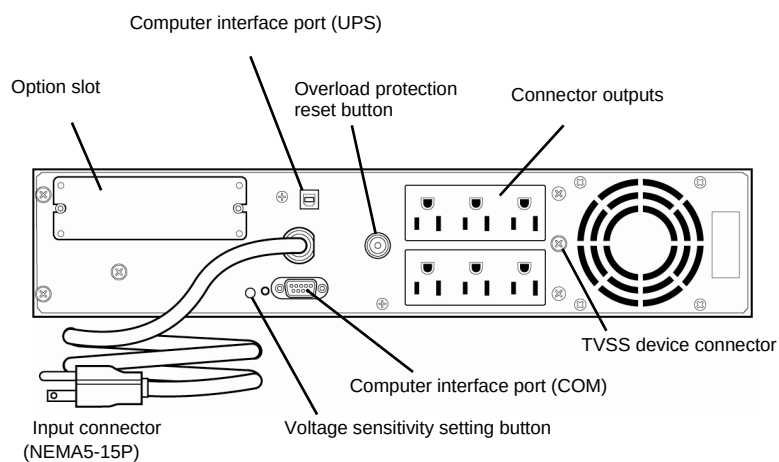
A leased line cannot be directly connected to the serial port connector.

If the server is mounted onto a rack, bundle cables with cable ties to prevent cables from getting tangled up after connecting peripheral devices.

2.2.1 Connecting to a uninterruptible power supply (UPS)

To connect the power cord of the server to the uninterruptible power supply (UPS), use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.

Example



When the power cord is connected to a UPS, the BIOS settings may need to be changed in order to link the server with the power supply from the UPS.

To change the settings, select **Server** and then **AC-LINK** in the BIOS setup utility, and change the displayed parameters. Select **Power On** to perform automatic operations by using the UPS. For details, refer to *Chapter 2 (1.2.4 Server)* in "Maintenance Guide".

NEC Express5800 Series Express5800/R110f-1E

3

Setup

This chapter describes how to set up the server.

1. Turning on the Server

POST (Power-On Self-Test) is explained in this section.

2. System BIOS Setup

You can customize the BIOS settings by following the instructions in this section.

3. EXPRESSSCOPE Engine 3

EXPRESSSCOPE Engine 3 provides useful features through the Baseboard Management Controller (BMC).

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows and maintain the server.

5. Installing Software Components

You can install Windows and bundled software by following the instructions in "*Installation Guide (Windows)*".

6. Turning off the Server

Turn off power when not using the server.

1. Turning on the Server

Pressing the POWER switch at the front of the server turns on the server.

Turn on the server by using the following procedure.

Tips

After connecting the power cord or turning off the server, wait for at least 30 seconds before pressing the POWER switch when the server is OFF.

1. Turn on the peripheral devices that connect to the display monitor and the server.

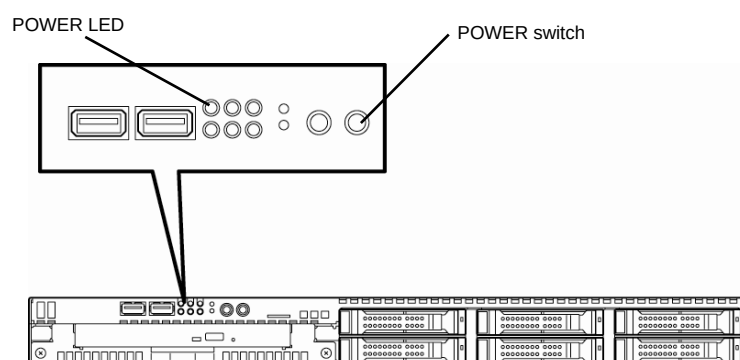
Note

If the power cord is connected to power control system such as an Uninterruptible Power Supply (UPS), make sure that the power control system is turned on.

2. Remove the front bezel.
3. Press the POWER switch at the front of the server.
The POWER LED is turned on green and after a while, the NEC logo appears on the display.

Important

Do not turn off the server until the NEC logo and some characters are displayed.



While the NEC logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, refer to *Chapter 3 (1.1.1 POST sequence)*.

1.1 POST

POST (Power-On Self-Test) is a self-diagnostic program stored in the server as standard. POST automatically runs immediately after the server is turned on and checks the motherboard, memory, processor (CPU), keyboard, and mouse. POST also displays the start-up messages of different utilities during the operation.

Usually, you do not need to check the contents of POST. However, check messages displayed at POST in the following cases.

- When introducing a server
- If you suspect a failure
- When you hear beep many times during the time between Power ON and OS startup
- When any error message is displayed

1.1.1 POST sequence

Explains how POST runs in order.

Important

- Do not make key entries or perform mouse operations while POST is in progress.
- Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before any key entry.
- Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST. In such a case, press the <F1> key to continue POST. Board configuration can be made using the utility described later.

1. When the server is turned on, POST runs.

POST starts memory check. When the memory check is completed, some messages appear.

As factory settings, the NEC logo appears on the screen during POST.



2. When **Password On Boot** is set to **Enabled** on the **Security** menu in the BIOS setup utility (SETUP), the logo is displayed, and then the password entry screen is displayed. If you enter the wrong password three times in a row, POST will stop and you cannot proceed to the subsequent operation. In this case, turn off and on the server.

Important

Do not set a password until you install the OS.

3. If the <Esc> key is pressed, the logo disappears and the details of POST are displayed.

Tips

You can set it to show the details of POST to be displayed from **BIOS** menu without requiring the <ESC> key to be pressed. From the System BIOS Setup, set **Quiet Boot** to **Disabled** in the **Boot** menu.

4. POST displays several types of message. These messages let you know that the installed CPU or connected keyboard and mouse are detected.

Tips

Depending on the installed PCI card configuration, the memory capacity might be displayed less than actually installed physical memory. (This applies to the display of BIOS Setup utility or OS system information.)

5. After a while, the following message is displayed on the screen.

Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network

By pressing the designated function key following messages, you can call the functions below upon completion of POST.

<F2> key: Run the SETUP. For information on the SETUP, refer to *Chapter 3 (2. System BIOS Setup)*.

<F3> key: Run EXPRESSBUILDER from Internal Flash Memory (optional). For information on EXPRESSBUILDER, refer to *Chapter 3 (4. EXPRESSBUILDER)*.

<F4> key: Run the offline tool. For information on the offline tool, refer to *Chapter 1 Maintenance (9. Offline Tools) in "Maintenance Guide"*.

<F12> key: Boot from network.

Note

- If the optional Internal Flash Memory is not installed in the system, the <F3> key message will not be displayed.
- The <F3> key must be pressed within 5 seconds of the message being displayed.
- Note that the server will not boot from the Internal Flash Memory even if it is specified to do so by pressing the <F3> key, as long as a bootable CD/DVD-ROM is set on the drive with the boot priority of CD/DVD-ROM is set to higher than Hard Disk Drive.

6. If a controller which has its dedicated BIOS such as a SAS controller board is installed, a message that prompts you to start the dedicated utility to set each board is displayed.

Example: If an optional SAS Controller is installed

Press Ctrl-C to start LSI Corp Configuration Utility...

The utility starts by pressing the <Ctrl> + <C> keys.

Example: If an optional RAID Controller is installed

Press <Ctrl> <H> for Web BIOS

The utility starts by pressing the <Ctrl> + <H> keys.

Example: If the jumper setting for an on-board RAID Controller is enabled

Press <Ctrl> <M> to Run LSI Software RAID Configuration Utility

The utility starts by pressing the <Ctrl> + <M> keys.

For details on the utility, refer to the manual supplied with each optional board.

Depending on the configuration, the message "Press Any Key" might appear to prompt a key entry. This is a behavior of the BIOS of the optional board. Continue to operate after checking the manual of the optional board.

7. If you set a password at **SETUP** in the BIOS Setup utility, the password entry screen appears upon successful completion of POST.

Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

Important

Do not set a password before OS is installed.

8. The OS starts when POST is completed.

1.1.2 POST error messages

When POST detects an error, it displays an error message on the screen or beeps for some errors. For descriptions of error messages, causes, and countermeasures, refer to "*Maintenance Guide*".

Note

Take notes on the messages displayed before consulting with your maintenance service company. Alarm messages are useful information for maintenance.

2. System BIOS Setup

This section describes how to configure Basic Input Output System (BIOS).

Before you install the server and add or remove optional devices, make sure you have read and understood this section to configure properly.

2.1 Overview

SETUP is a utility to do basic hardware settings. This utility is pre-installed in the Internal Flash Memory in the server as standard and can be run without requiring a media for boot.

In most of cases, the SETUP was configured for optimal performance before the server was shipped to you. Therefore, in most of cases, you should not need to use the SETUP utility. **Use only when the case applies to any of cases described in Chapter 3 (2.4 Cases that Require Setting Changes).**

2.2 Starting SETUP Utility

Run POST following *Chapter 3 (1.1.1 POST sequence)*.

After a while, the following message will be displayed on the lower left of the screen.

Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network

If you press the <F2> key at this time, SETUP runs and displays the **Main** menu upon completion of POST. (You can also press the <F2> key while the NEC logo appears to display the **Main** menu.)

Important	If a password is set, you will be prompted to enter the password at the next startup of the SETUP utility. (The timing at which the prompt appears depends on the setting of the password.) Up to three password entry attempts are possible. If you enter a wrong password three times in a row, the system stops (you can no longer proceed.) In this case, turn off and on the server.
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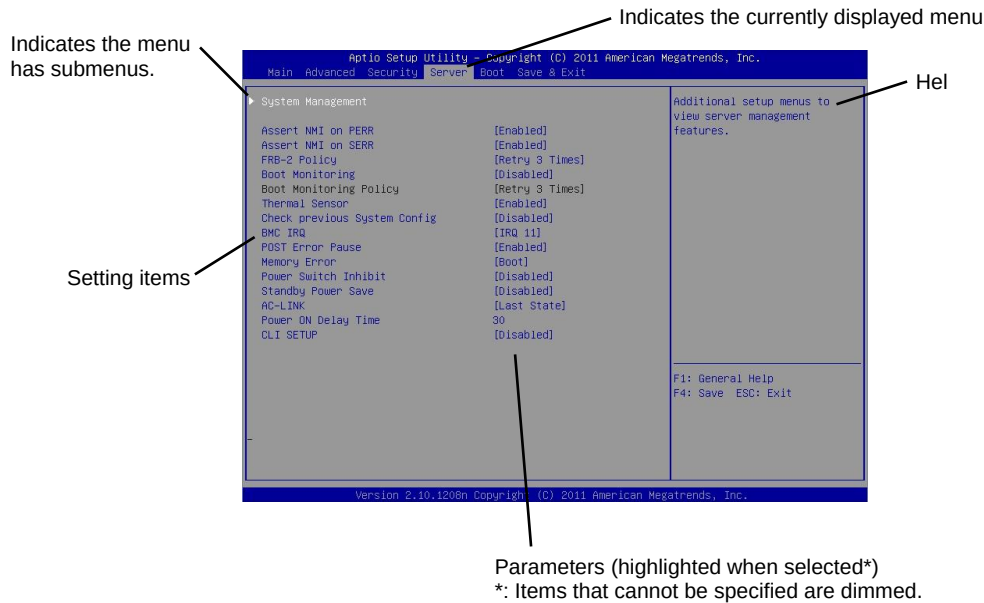
To exit the SETUP utility after saving the parameters, select **Save & Exit** and then **Save Changes and Exit**.

To exit the SETUP utility without saving the parameters, select **Save & Exit** and then **Discard Changes and Exit**.

Important	To restore the default values, select Save & Exit and then Load Setup Defaults. (The default values might differ from the factory settings.)
------------------	---

2.3 Description on On-Screen Items and Key Usage

This section shows display examples and how to control the key. Use the keyboard to work with the SETUP utility.



- ☐ Cursor keys (<↑>, <↓>)
Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.
- ☐ Cursor keys (<←>, <→>)
Select menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.
- ☐ <→> key/<+> key
Change the value (parameter) of the selected item. You cannot use this key when a menu which has ► on the left is selected.
- ☐ <Enter> key
Press this key to confirm the selected parameter.
- ☐ <Esc> key
Pressing this key takes you to the previous screen. If you keep pressing the key, the following window is displayed. If you select **Yes**, the SETUP closes without saving the changed parameters.

Quit without saving?	
[Yes]	No

- ☐ <F1> key
Press this key to display help information. If you need help using the SETUP, press this key. Press the <Esc> key to go back to the original screen.

☐ <F2> key

If you press this key, the following window appears. If you select **Yes**, the previous parameter(s) are restored.

Load Previous Values?	
[Yes]	No

☐ <F3> key

If you press this key, the following window appears. If you select **Yes**, restore the parameters of the currently selected item to the default setting. (**This might be different from the parameters configured before shipment.**)

Load Setup Defaults?	
[Yes]	No

☐ <F4> key

If you press this key, the following window appears. If you select **Yes**, the parameter you configured is saved and SETUP closes.

Save configuration and exit?	
[Yes]	No

2.4 Cases that Require Setting Changes

If you change the BIOS settings shown below, use the SETUP utility to change a parameter which was configured as factory setting. Other than cases described below, do not change the settings. A list of SETUP parameters and factory settings are described in **Chapter 2 (1. System BIOS) in "Maintenance Guide"**.

Category	Description	To be changed	Remark
Basic	Change date and time	Main → System Date Main → System Time	Configurable on OS
	On/Off NumLock on power ON	Boot → Bootup Numlock State	
	On/Off the function to display the NEC logo during POST	Boot → Quite Boot → Disabled	By pressing the <Esc> key, prevent the display of the logo.
Memory	Configure the memory after the DIMM is added or exchanged.	Advanced → Memory Configuration → Memory Retest → Yes	After rebooting, the Memory Retest setting changes to No automatically.
Optional board	Install RAID Controller board	Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCI Slot n Option ROM → Enabled	n is PCI slot number of the RAID Controller
	When an optional board is installed, set to [Disabled] for Option ROM for all PCI devices except for the boot device.	Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCI Slot n Option ROM → Enabled	"n": Slot number in the PCI device (except for the boot device)
		Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → LAN1 Option ROM Scan → Disabled	Option ROM on LAN1 must be disabled.
Boot	Change the boot order of devices	Boot → Boot Option Priorities → Change the boot priority	
	Use remote power on function (from modem)	Advanced → Advanced Chipset Configuration → Wake On Ring → Enabled	
	Use remote power on function (from RTC alarm)	Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled	
	Control from HW console terminal	Advanced → Serial Port Configuration → Change respective setting.	
Security	Set a password to restrict operation of the SETUP utility.	Security → Administrator Password → Security → User password	After a password is set, a message prompting you to enter the password is displayed when the SETUP utility is launched next time.
	Set a password to restrict booting.	Security → Password on Boot → Enabled	You can select this parameter after you set a password.

Category	Description	To be changed	Remark
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	Server → Power Control Configuration → AC-LINK → Power On	
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	Server → Power Control Configuration → AC-LINK → Last State	
	Keep the power OFF even when UPS supplies power.	Server → Power Control Configuration → AC-LINK → Stay off	

Password

If you have set a password, a message prompt you to enter password will be displayed from the next time.

Enter password []

You can attempt password entry up to 3 times. **If you entered a wrong password 3 times, operation stops.**
(You cannot operate further.) Turn off the power.

Saving changes

If you finish configuration, select **Save & Exit** and then **Save Changes and Exit** to save changes and exit.

If you wish to exit without saving the changed parameters, select **Save & Exit** and then **Discard Changes and Exit**.

Or if you wish to restore the setting to default values, select **Save & Exit** and then **Load Setup Defaults**.

(The default value might be different from the factory setting.)

3. EXPRESSSCOPE ENGINE 3

3.1 Overview

EXPRESSSCOPE Engine 3 provides a variety of features using BMC (Baseboard Management Controller), which is a system management LSI.

EXPRESSSCOPE Engine 3 monitors the power unit, fans, temperature, and voltage of the server. If you have the management LAN connector connected to the network, you can remotely perform the following over a web browser or SSH client:

- Manage the server
- Remotely control the keyboard, video, and mouse (KVM)*
- Remotely access a CD/DVD/floppy disk/ISO image/USB memory*.

* To use this feature, the optional license for remote management (N8115-04) is required.

To enable this feature, a USB mass storage device (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is virtually connected.

If the server runs on Windows Server 2008 R2, this feature does not support the video resolution of 1280 x 1024 (at 60 Hz, 32-bit).

Note

(If N8115-04 Remove KVM and Media License if installed)

More than one removable drives other than the actual drive are displayed on the operating system of the host system. This is a normal operation and these added removable drives are the virtual removable drives reserved for the remote media function of EXPRESSSCOPE Engine 3 (*1).

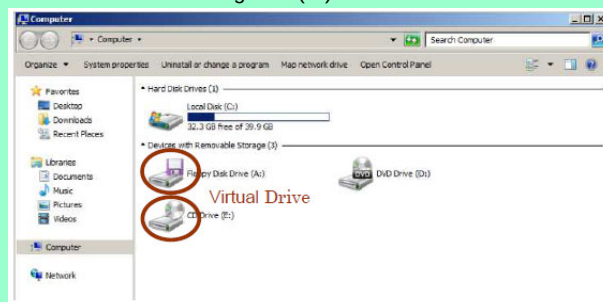


Fig. 1 Exp. Windows Server 2008 R2 Computer Folder (*2)

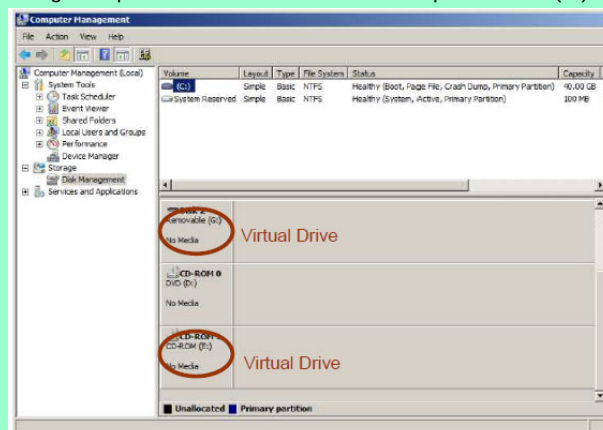


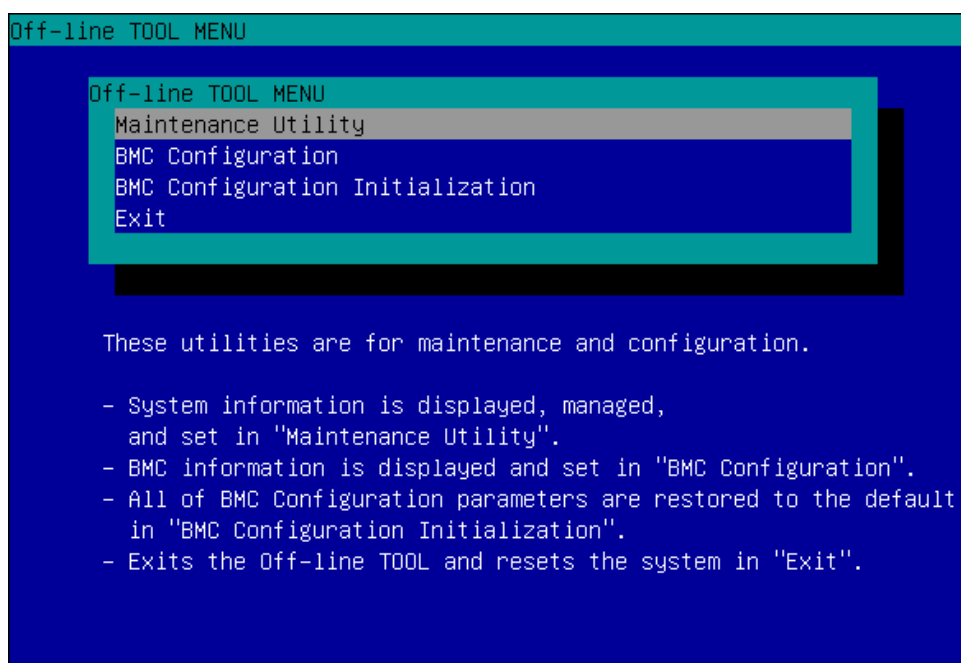
Fig. 2 Exp. Windows Server 2008 R2 Server Manager (*2)

- *1 A function to use FD/CD/DVD drives, ISO images and USB memories connected to the management PC as drives virtually connected to the host system.
- *2 The number of drives and the drive character are different depending on system configurations.

3.2 EXPRESSSCOPE ENGINE 3 Network configuration

To enable EXPRESSSCOPE Engine 3 to be used via network, network configuration is required. Below is an example of the configuration procedure which enables EXPRESSSCOPE Engine 3 to be used via a web browser.

1. Run POST following *Chapter 3 (1.1.1 POST sequence)*. Wait until the following message appears on the lower left of the screen.
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
2. If you press the <F4> key at this time, ROM utility starts upon completion of POST. You can also press the <F4> key while the NEC logo is being displayed to open the Off-line TOOL MENU screen.
3. The keyboard selection screen appears. Select your keyboard type.
After that, the Off-line TOOL MENU screen appears. On this screen, specify the network settings for EXPRESSSCOPE Engine 3.
4. When the Off-line TOOL MENU appears, select **BMC Configuration**, **BMC Configuration**, **Network**, and then **Property**.



- 5. If **Property** is selected, the following screen is displayed. On this screen, specify whether to use DHCP and if DHCP is not used, configure IP Address/Subnet Mask.

Network (Property)

Items	: Values
Connection Type	: [Auto Negotiation]
BMC MAC Address	: 00-11-22-AA-BB-CC
DHCP	: [Disable]
IP Address [Required]	: [192.168.0.1]
Subnet Mask [Required]	: [255.255.255.0]
Default Gateway	: [192.168.0.2]
DNS Server	: [192.168.0.3]
Host Name	: [HostName]
Domain Name	: [DomainName]
< OK >	
< Cancel >	
< Load Default Value >	

Select: [Enter] Cancel: [ESC] Help: [Home or ?]

Tips

If **Shared BMC LAN** is enabled, Web feature, remote media/KVM feature, or command line interface feature may be interrupted. In this case, wait for a while, and connect with network again.

- 6. Connect the LAN cable to the management LAN connector in order to connect to the network. It will be available for use if you access EXPRESSSCOPE Engine 3 via Web browser from PC for management according to the setting.

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER

EXPRESSBUILDER provides the following features.

Features	Descriptions
Setup (Windows reinstallation)	Installs Windows on your server. Easily completes the process from RAID configuration to installation of applications. To use this feature, select Os installation in the menu after boot.
Storage of software*	Stores various bundled software (such as NEC ESM PRO Agent).
Maintenance	Diagnoses your server system. To use this feature, select Tool menu in the menu after boot.
Storage of documents*	Stores various documents (including "User's Guide", "Installation Guide" and "Maintenance Guide").

* Documents and some software components are not stored in N8115-05 Internal Flash Memory (option).

4.2 Starting EXPRESSBUILDER

If you want to install Windows, start EXPRESSBUILDER by using any of the following.

EXPRESSBUILDER DVD:

Set the DVD on the drive and either turn on the server or restart the server by pressing <Ctrl> + <Alt> + <Delete>. EXPRESSBUILDER is booted from DVD.

If you want to install any bundled software or see documents, set the DVD to a computer running Windows. The Autorun menu appears automatically.

N8115-05 Internal Flash Memory (option):

During POST, press <F3>. If you start with this option, **make sure that the media was removed from the drive.**

5. Installing Software Components

Continue to install software components such as OS.

Refer to the instructions below.

- [Installation Guide \(Windows\)](#)

6. Turning off the Server

Turn off the server by using the following procedure. If the power cord of the server is connected to a UPS, refer to the documentation supplied with the UPS or the documentation for the application controlling the UPS.

1. Shut down the OS.
2. The server automatically turns off after the OS shuts down.

Confirm that POWER LED is OFF.

3. Turn off peripheral devices.

Tips

Hibernate function of Windows Server cannot be used. Do not set Hibernate at Windows shutdown.

NEC Express5800 Series Express5800/R110f-1E

4

Appendix

1. Specifications
2. Interrupt Lines

1. Specifications

1.1 2.5-inch Drive Model

Product name			Express5800/R110f-1E, EXP283A			
Model			N8100-1999F			
CPU	Type	Intel® Xeon® processor E3-1220 v3	Intel® Xeon® processor E3-1230 v3	Intel® Xeon® processor E3-1265L v3	Intel® Xeon® processor E3-1270 v3	
	Clock	3.10 GHz	3.30 GHz	2.50 GHz	3.50 GHz	
	Standard/Maximum	1/1				
	1st cache	32 KB instruction/32 KB data				
	2nd cache	256 KB				
	Number of cores/ Number of threads (T) (1 CPU)	4C/4T	4C/8T	4C/8T	4C/8T	
Chipset		Intel® C224 chipset				
Memory	Standard/Maximum	Not pre-installed (installation required)/32 GB (4 x 8 GB)				
	Memory module	DDR3L-1600 SDRAM DIMM, unbuffered				
	Maximum clock	1600 MHz				
	Error check, correction	ECC				
Auxiliary storage	Drive bay	Standard	—			
		Maximum*3	2.5-inch HDD: SATA 8 TB (8 x 1 TB), SAS 9.6 TB (8 x 1.2TB) 2.5-inch SSD: SAS 3.2 TB (8 x 400 GB)			
		Hot swap	Supported			
	Interface level/ RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard), RAID 5/6/50 (optional) SAS 6 Gb/s: RAID 0/1/5/6/10/50 (optional)			
	Optical disk drive		Internal/external drive (optional) *1			
	FDD		Option: Flash FDD (1.44 MB) *2			
Expansion slots	Device bay	—				
	Supported slot	1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 1x PCI EXPRESS 2.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)				
Graphics	Chip/VideoRAM	Management controller chip/32 MB				
	Graphic display/ resolution	16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x1,024				
Interface		1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub 9 pins, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 4 x USB 2.0 (1 x front, 2 x rear, 1 x internal) 3 x USB 3.0 (1 x front, 2 x rear)				
Redundant power supply		—				
Redundant fan		Supported (optional)				
External dimensions (width × depth × height)		444.0 x 615.2 x 43.6 mm (protrusions not included) 485.0 x 740.9 x 44.3 mm (front bezel/ protrusions/ inner rails included)				
Weight (Standard/Max.)		10 kg/17.5 kg (including rails)				

Product name	Express5800/R110f-1E, EXP283A
Model	N8100-1999F
Power supply	1 x 400 W 80 PLUS® Platinum compliant (bipolar grounded outlet) (hot-plug unavailable) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz (power cable must be selected)
Power rating	462 W
Environmental requirements Temperature/Humidity	Operating: 10 to 40°C/20 to 80%, Storage: -10 to 55°C/20 to 80% (no condensation either when operating or when stored)
Main accessories	EXPRESSBUILDER (NEC ESMPro Manager) (Windows), NEC ESMPro Agent, User's Guide (electronic document) included), Getting Started, one-touch rack rail (mounted on the server as standard) Power code
Installed OS	—
Supported OSs	Microsoft® Windows Server® 2008 Standard (RTM, SP2 or later), Microsoft® Windows Server® 2008 Enterprise (RTM, SP2 or later), Microsoft® Windows Server® 2008 R2 Standard, Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard, Microsoft® Windows Server® 2012 Datacenter VMware ESXi™ 5.1 update 1 Red Hat® Enterprise Linux® 5.9 or later Red Hat® Enterprise Linux® 5.9 or later (EM64T) Red Hat® Enterprise Linux® 6.4 or later Red Hat® Enterprise Linux® 6.4 or later (x86_64)

*1 If you do not intend to install an internal DVD-ROM or an internal DVD SuperMULTI in all systems, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.

*2 Prepare this if required. For the principal uses of a Flash FDD, refer to the notes on Flash FDD in the Maintenance Guide.

Product name			Express5800/R110f-1E, EXP284A			
Model			N8100-2000F			
CPU	Type	Intel® Xeon® processor E3-1220 v3		Intel® Xeon® processor E3-1230 v3	Intel® Xeon® processor E3-1265L v3	Intel® Xeon® processor E3-1270 v3
	Clock	3.10 GHz		3.30 GHz	2.50 GHz	3.50 GHz
	Standard/Maximum	1/1				
	1st cache	32 KB instruction/32 KB data				
	2nd cache	256 KB				
	Number of cores/ Number of threads (T) (1 CPU)	4C/4T	4C/8T	4C/8T	4C/8T	
Chipset		Intel® C224 chipset				
Memory	Standard/Maximum		Not pre-installed (installation required)/32 GB (4 x 8 GB)			
	Memory module		DDR3L-1600 SDRAM DIMM, unbuffered			
	Maximum clock		1600 MHz			
	Error check, correction		ECC			
Auxiliary storage	Drive bay	Standard	—			
		Maximum*3	2.5-inch HDD: SATA 8 TB (8 x 1 TB), SAS 9.6 TB (8 x 1.2TB) 2.5-inch SSD: SAS 3.2 TB (8 x 400 GB)			
		Hot swap	Supported			
	Interface level/ RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard), RAID 5/6/50 (optional) SAS 6 Gb/s: RAID 0/1/5/6/10/50 (optional)			
	Optical disk drive		Internal/external drive (optional) *1			
	FDD		Option: Flash FDD (1.44 MB) *2			
	Expansion slots	Device bay		—		
Supported slot		1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 1x PCI EXPRESS 2.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)				
Graphics	Chip/VideoRAM		Management controller chip/32 MB			
	Graphic display/ resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x1,024			
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub 9 pins, serial port A, 1 x rear, optional port can be used (up to two ports in total) 4 x USB 2.0 (1 x front, 2 x rear, 1 x internal) 3 x USB 3.0 (1 x front, 2 x rear)			
Redundant power supply			Supported			
Redundant fan			Supported (optional)			
External dimensions (width × depth × height)			444.0 x 615.2 x 43.6 mm (protrusions not included) 485.0 x 740.9 x 44.3 mm (front bezel/protrusions/inner rails included)			
Weight (Standard/Max.)			10 kg/17.5 kg (including rails)			

Product name	Express5800/R110f-1E, EXP284A
Model	N8100-2000F
Power supply	2 x 500 W 80 PLUS® Gold compliant (bipolar grounded outlet) (hot-plug available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz (power cable must be selected)
Power rating	513 W
Environmental requirements Temperature/Humidity	Operating: 10 to 40°C/20 to 80%, Storage: -10 to 55°C/20 to 80% (no condensation either when operating or when stored)
Main accessories	EXPRESSBUILDER (NEC ESMPRO Manager) (Windows), NEC ESMPRO Agent, User's Guide (electronic document) included), Getting Started, one-touch rack rail (mounted on the server as standard) Power code
Installed OS	—
Supported OSs	Microsoft® Windows Server® 2008 Standard (RTM, SP2 or later) Microsoft® Windows Server® 2008 Enterprise (RTM, SP2 or later) Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter VMware ESXi™ 5.1 update 1 Red Hat® Enterprise Linux® 5.9 or later Red Hat® Enterprise Linux® 5.9 or later (EM64T) Red Hat® Enterprise Linux® 6.4 or later Red Hat® Enterprise Linux® 6.4 or later (x86_64)

*1 If you do not intend to install an internal DVD-ROM or an internal DVD SuperMULTI in all systems, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.

*2 Prepare this if required. For the principal uses of a Flash FDD, refer to the notes on Flash FDD in the Maintenance Guide.

1.2 3.5-inch Drive Model

Product name			Express5800/R110f-1E, EXP283A			
Model			N8100-1986F			
CPU	Type		Intel® Xeon® processor E3-1220 v3	Intel® Xeon® processor E3-1230 v3	Intel® Xeon® processor E3-1265L v3	Intel® Xeon® processor E3-1270 v3
	Clock		3.10 GHz	3.30 GHz	2.50 GHz	3.50 GHz
	Standard/Maximum		1/1			
	1st cache		32 KB instruction/32 KB data			
	2nd cache		256 KB			
	Number of cores/ Number of threads (T) (1 CPU)		4C/4T	4C/8T	4C/8T	4C/8T
Chipset			Intel® C224 chipset			
Memory	Standard/Maximum		Not pre-installed (installation required)/32 GB (4 x 8 GB)			
	Memory module		DDR3L-1600 SDRAM DIMM, unbuffered			
	Maximum clock		1600 MHz			
	Error check, correction		ECC			
Auxiliary storage	Drive bay	Standard	—			
		Maximum*3	3.5-inch HDD: SATA 16TB (4 x 4 TB)			
		Hot swap	Supported			
	Interface level/RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard*1), RAID 5/6 (optional)			
	Optical disk drive		Internal/external drive (optional) *2			
	FDD		Option: Flash FDD (1.44MB) *3			
	Additional bay		None			
	Additional slots	Supported slots	1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 1x PCI EXPRESS 2.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)			
Graphics	Chip/VideoRAM		Management controller chip/32 MB			
	Graphic display/resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x 1,024			
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub9 pin, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 4 x USB 2.0 (1 x front, 2 x rear, 1 x internal) 3 x USB 3.0 (1 x front, 2 x rear)			
Redundant power supply			—			
Redundant fan			Supported (optional)			
External dimensions (width × depth × height)			444.0 x 615.2 x 43.6 mm (protrusions not included) 485.0 x 740.9 x 44.3 mm (front bezel/inner rails/protrusions included)			
Weight (Standard/Max.)			10 kg/17.5 kg (including rails)			
Power supply			1 x 400 W 80 PLUS® Platinum compliant (bipolar grounded outlet) (hot-plug unavailable) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz (power cable must be selected)			
Power rating			462 W			

Product name		Express5800/R110f-1E, EXP283A	
Model		N8100-1986F	
Environmental requirements Temperature/Humidity		Operating: 10 to 40°C/20 to 80%, Storage: -10 to 55°C/20 to 80% (no condensation either when operating or when stored)	
Main accessories		EXPRESSBUILDER (NEC ESM PRO Manager) (Windows), NEC ESM PRO Agent, User's Guide (electronic document) included), Getting Started, one-touch rack rail (mounted on the server as standard) Power code	
Installed OS		—	
Supported OSs	OSs supported by NEC	Microsoft® Windows Server® 2008 Standard (RTM, SP2 or later) Microsoft® Windows Server® 2008 Enterprise (RTM, SP2 or later) Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter VMware ESXi™ 5.1 update 1 Red Hat® Enterprise Linux® 5.9 or later Red Hat® Enterprise Linux® 5.9 or later (EM64T) Red Hat® Enterprise Linux® 6.4 or later Red Hat® Enterprise Linux® 6.4 or later (x86_64)	

- *1 When using an onboard RAID configuration, RAID10 is not supported if an additional 2 TB HDD is installed.
- *2 If you do not intend to install an internal DVD-ROM or an internal DVDSuperMULTI in all systems, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.
- *3 Prepare this if required. For principal uses of a Flash FDD, refer to the notes on Flash FDD in the Maintenance Guide.

Product name			Express5800/R110f-1E, EXP284A			
Model			N8100-1998F			
CPU	Type		Intel® Xeon® processor E3-1220 v3	Intel® Xeon® processor E3-1230 v3	Intel® Xeon® processor E3-1265L v3	Intel® Xeon® processor E3-1270 v3
	Clock		3.10 GHz	3.30 GHz	2.50 GHz	3.50 GHz
	Standard/Maximum		1/1			
	1st cache		32 KB instruction/32 KB data			
	2nd cache		256 KB			
	Number of cores/ Number of threads (T) (1 CPU)		4C/4T	4C/8T	4C/8T	4C/8T
Chipset			Intel® C224 chipset			
Memory	Standard/Maximum		Not pre-installed (installation required)/32 GB (4 x 8 GB)			
	Memory module		DDR3L-1600 SDRAM DIMM, unbuffered			
	Maximum clock		1600 MHz			
	Error check, correction		ECC			
Auxiliary storage	Drive bay	Standard	—			
		Maximum*3	3.5-inch HDD: SATA 16TB (4 x 4 TB)			
		Hot swap	Supported			
	Interface level/RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard*1), RAID 5/6 (optional)			
	Optical disk drive		Internal/external drive (optional) *2			
	FDD		Option: Flash FDD (1.44MB) *3			
	Additional bay		None			
Additional slots	Supported slots		1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 1x PCI EXPRESS 2.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)			
Graphics	Chip/VideoRAM		Management controller chip/32 MB			
	Graphic display/resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x 1,024			
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub9 pin, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 4 x USB 2.0 (1 x front, 2 x rear, 1 x internal) 3 x USB 3.0 (1 x front, 2 x rear)			
Redundant power supply			Supported			
Redundant fan			Supported (optional)			
External dimensions (width × depth × height)			444.0 x 615.2 x 43.6 mm (protrusions not included) 485.0 x 740.9 x 44.3 mm (front bezel/inner rails/protrusions included)			
Weight (Standard/Max.)			10 kg/17.5 kg (including rails)			
Power supply			2 x 500 W 80 PLUS® Gold compliant (bipolar grounded outlet) (hot-plug available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz (power cable must be selected)			
Power rating			513 W			

Product name		Express5800/R110f-1E, EXP284A	
Model		N8100-1998F	
Environmental requirements Temperature/Humidity		Operating: 10 to 40°C/20 to 80%, Storage: -10 to 55°C/20 to 80% (no condensation either when operating or when stored)	
Main accessories		EXPRESSBUILDER (NEC ESMPRO Manager) (Windows), NEC ESMPRO Agent, User's Guide (electronic document) included), Getting Started, one-touch rack rail (mounted on the server as standard) Power code	
Installed OS		—	
Supported OSs	OSs supported by NEC	Microsoft® Windows Server® 2008 Standard (RTM, SP2 or later) Microsoft® Windows Server® 2008 Enterprise (RTM, SP2 or later) Microsoft® Windows Server® 2008 R2 Standard Microsoft® Windows Server® 2008 R2 Enterprise Microsoft® Windows Server® 2012 Standard Microsoft® Windows Server® 2012 Datacenter VMware ESXi™ 5.1 update 1 Red Hat® Enterprise Linux® 5.9 or later Red Hat® Enterprise Linux® 5.9 or later (EM64T) Red Hat® Enterprise Linux® 6.4 or later Red Hat® Enterprise Linux® 6.4 or later (x86_64)	

- *1 When using an onboard RAID configuration, RAID10 is not supported if an additional 2 TB HDD is installed.
- *2 If you do not intend to install an internal DVD-ROM or an internal DVDSuperMULTI in all systems, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.
- *3 Prepare this if required. For principal uses of a Flash FDD, refer to the notes on Flash FDD in the Maintenance Guide.

2. Interrupt Lines

Interrupt lines are assigned as factory settings as shown below. Use this table as a reference when you add optional devices.

- **Interrupt lines**

As factory settings, interrupt lines are assigned as follows.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	8	Real-time clock
1	–	9	Microsoft ACPI-Compliant System
2	Cascade connection	10	PCI
3	COM 2 serial port	11	PCI
4	COM 1 serial port	12	–
5	PCI	13	Arithmetic operation processor
6	–	14	–
7	–	15	–